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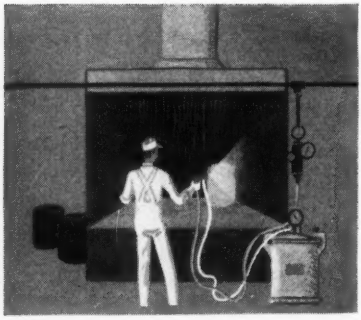
spray painting systems



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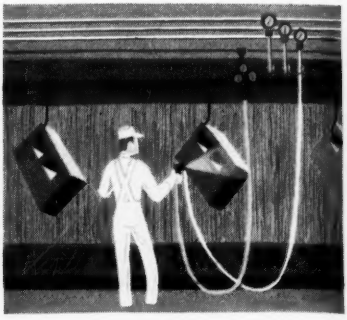

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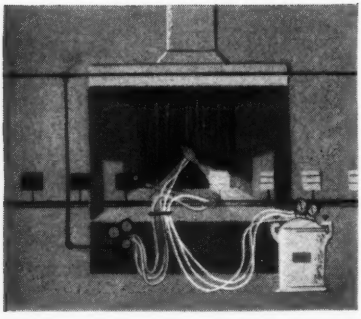

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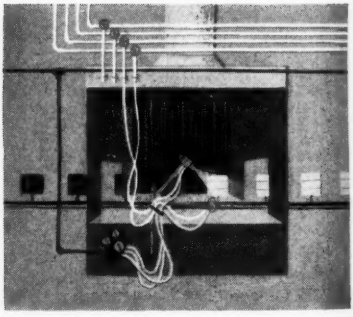

paint circulating systems

Don G. Gardner

1889 - 1947

DON G. GARDNER, President of Gardner Publications, Incorporated, died May 15, 1947.

Born in Monticello, Indiana, Mr. Gardner spent his early life in and near that section. In 1911 he entered the publication field as a space salesman, working first on various newspapers and later on industrial magazines. In 1919 he became Southwestern Manager of Iron Age, leaving that position in 1928 to organize the company which bears his name.

DON G. GARDNER

This company was founded primarily to publish Modern Machine Shop, but as the years passed and the need for an additional magazine to serve the metal - finishing field seemed obvious, the decision was made to establish the magazine Products Finishing. This was done in 1936. Again, in 1940, an opportunity for service both to the industrialists in the Latin - American countries and the machine tool and plant equipment manufacturers in this country became apparent, and the magazines El Taller Mecanico Moderno and Oficina Mecanica Moderna were born. Under Mr. Gardner's guidance all of these magazines successfully have assumed the tasks that were allotted to them.

Mr. Gardner knew personally practically every manufacturer in the plant equipment and machine tool field, and was one of the organizers of the Cincinnati Industrial Advertisers' Association. He made several trips to the Latin - American countries in order to survey the market possibilities there for American-made tools and equipment, and had been called upon to discuss this subject before a number of interested groups. His untiring energy was always at the service of the industry with which he was identified.

His friends and associates mourn his passing, and it is a tribute to the excellence of his management that the company which he founded will carry on, adhering in the future to the policies that have guided it in the past.

Convention Headquarters—
Hotel Statler

A. E. S.

34th ANNUAL CONVENTION

DETROIT, JUNE 23-27

The Detroit Branch has completed its plans to serve as host to the American Electroplaters' Society's 34th Annual Convention during the week of June 23. Each member of the Detroit Branch feels a personal responsibility in this great undertaking and has appointed himself a committee of one to help make a visit to this year's Convention and Exposition both profitable and entertaining.

The Society, with headquarters at the Statler Hotel, has arranged to hold technical sessions at which nationally known speakers will present papers on subjects of vital interest to electrochemists, engineers, and others who are interested in the field of metal finishing. Exhibits of plated articles from the various branches of the American Electroplaters' Society throughout the United States will be on display in the Hotel.

NATIONAL OFFICERS
AMERICAN ELECTROPLATERS' SOCIETY

(Right) F. K. Savage, President.

(Below—Left to Right) Kenneth M. Huston, First Vice-President; S. S. Johnston, Second Vice-President; Arthur W. Logozzo, Third Vice-President; A. K. Graham, Executive Secretary.

Detroit's automobile companies have said to the A.E.S., "come and see us again." Several of the nationally known plants are listed in the official program for plant visitations and others can be visited by making special arrangements. The managing staff of Hooker Kresge Library located at Wayne University in Detroit, has extended an invitation to all visitors who desire to avail themselves of the opportunity to examine the most complete library pertaining to the art of plating.

On the pleasure side, a full program of entertainment for the members and their wives has been arranged and is fully outlined in the official program. Included in the plans are the Annual Good Fellowship luncheon and Open House gathering in the evening of the opening day. Luncheons for the ladies, including fashion shows, have been arranged. One evening is being given over to a moonlight cruise for the members, wives, and friends aboard the lake steamer "Put-in-Bay."

The Plating Institute and the job and contract platers of Detroit have made preparations to serve as hosts to luncheons and also conduct their Annual Luncheon and Dinner as outlined in the official program.

Every moment spent at the Convention will be of immense value and pay handsome dividends in the very near future. The committee wishes to take this opportunity to express its appreciation of the cooperation of the many firms who have so generously helped in making this Convention possible.

Official Program

SUNDAY, JUNE 22

3:00 P.M.—Registration, Ballroom Floor, Hotel Statler.

Registration fees: Gentlemen, $7.50; Ladies, $7.50. This entitles the registrant to a book of tickets to be used for all A.E.S. functions and activities. Registrants need not be members of the Society.

MONDAY, JUNE 23

8:00 A.M.—Registration, Ballroom Floor, Hotel Statler.

10:15 A.M.—Opening Session of the Convention, Grand Ballroom, Ballroom Floor, Hotel Stater.

Presiding—GEORGE L. NANKERVIS, Convention General Chairman. Invocation—DR. HERBERT BEECHER HUDNUT. Formal Opening of 1947 Convention—GEORGE L. NANKERVIS, Convention General Chairman. Welcome to Detroit—HON. EDWARD J. JEFFRIES, JR., Mayor, City of Detroit. Greetings from the Detroit Branch—W. W. WILSON, President, Detroit Branch. Report of the President—FRANK K. SAVAGE, A.E.S. President.

12:30 P.M.—Luncheon, International Fellowship Club, Michigan Room, Hotel Statler.

This luncheon is exclusively for suppliers and their representatives. Following the luncheon will be an election of officers for the coming year and a discussion of the arrangements for the Open House.

2:00 P.M.—First Educational Session.

8:30 P.M.—Open House, Grand Ballroom, Hotel Statler.

Dancing, Buffet Lunch and Refreshments. The open house is sponsored by the International Fellowship Club and is held on the first night of the Convention as an opportunity for all registrants to become acquainted as well as to create goodwill in the metal-finishing industry. Membership in the International Fellowship Club is restricted to manufacturers' supply houses and their representatives serving the metal-finishing industry and it is through their generosity that the open house is possible. A ticket for this event is included in your registration booklet.

More efficient!

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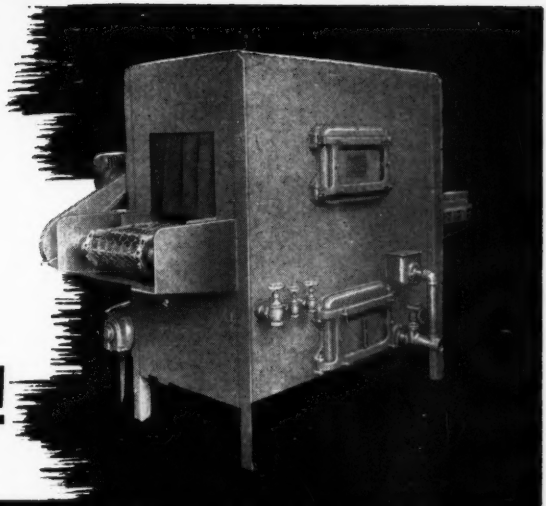

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TUESDAY, JUNE 24

8:30 A.M.—Registration, Ballroom Floor, Hotel Statler.

9:30 A.M.—Second Educational Session.

12:00 Noon—Luncheon, Plating Institute of Michigan, Michigan Room, Hotel Statler.

This luncheon is for members of the Plating Institute only.

TUESDAY AFTERNOON—

This is the time set aside for the members, wives, friends and guests to leisurely visit the Industrial Finishing Exposition at Convention Hall—just out Woodward Avenue. Here you will see the exhibits of more than one hundred nationally known manufacturers: the latest developments in metal finishing, plating equipment and materials. See plating being actually carried on and meet the men responsible for these new methods and developments.

12:30 P.M.—GOLF TOURNAMENT—

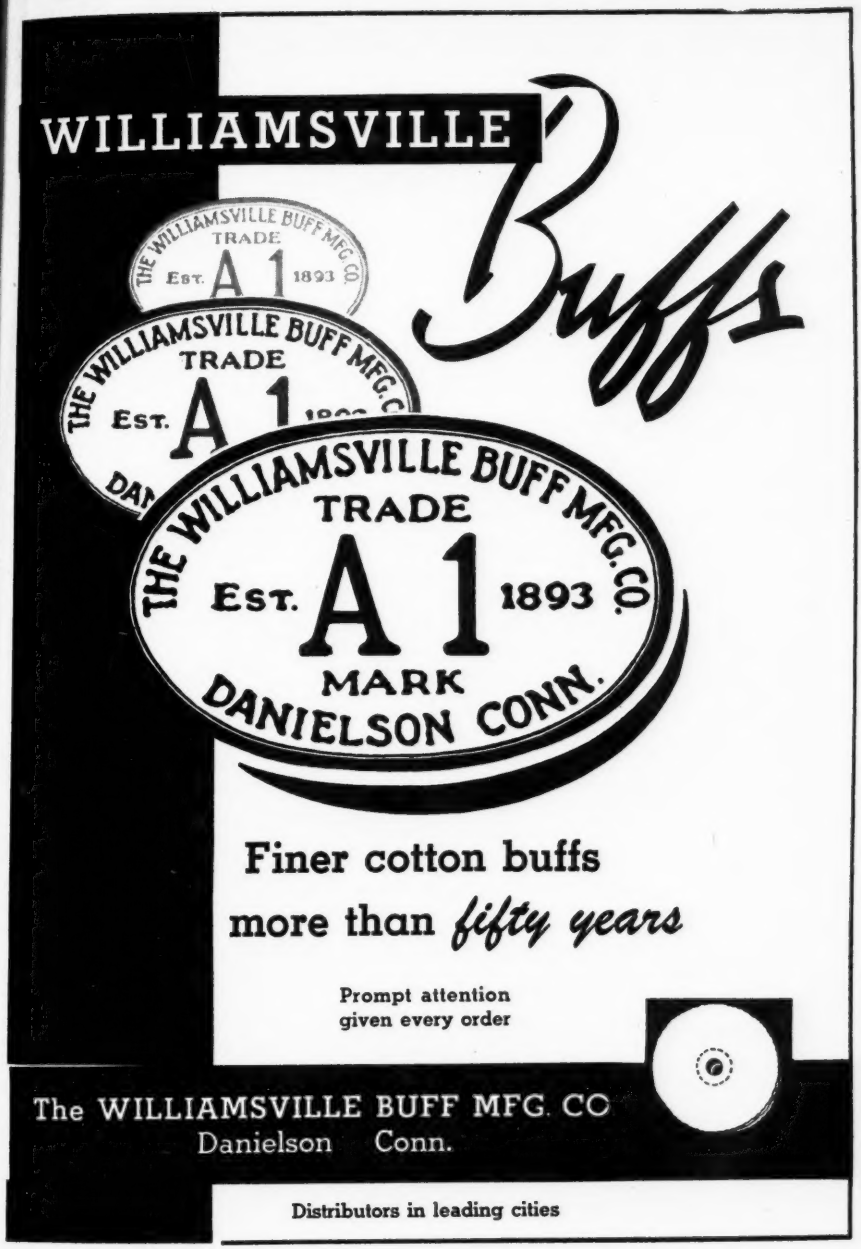
A golf tournament under the sponsorship of the International Fellowship Club will be held at the Western Golf Club. Prizes will be given for certain accomplishments. Busses will leave the Bagley Street entrance of the Hotel Statler at 12:30 p.m.

NOTE—Luncheon will be available at the Golf Club.

Possibly some visitors to the Convention will be unable to remain in Detroit throughout the entire week. For those who are unable to participate in Friday's plant visitation trips, Tuesday afternoon is designated for making special plant visits. If you are unable to arrange for making your desired visits, please fill out the form given to you with the registration booklet and give all the information asked for. Every effort will be made to arrange your requested plant visitation. For information regarding special plant visitations please contact Mr. C. R. Beaubien, Chairman of the Plant Visitation Committee. Plans for plant visitation on this day are not as extensive as on Friday, June 27. If at all possible, plan to stay through Friday and visit the large production plants whose fame is known throughout the world. Transportation will be provided from the Bagley Street entrance of the Hotel Statler.

8:00 P.M.—MOONLIGHT CRUISE—

Shuttle busses will leave the Bagley Street entrance of the Hotel Statler starting at 8:00 p.m. for the dock (foot of First Street). The boat "Put-In-Bay" has been engaged exclusively for the Convention and will sail at 8:45 p.m. for a cruise in Lake St. Clair, returning at 11:45 p.m. Music, dancing, and refreshments will be supplied. Shuttle bus service to the Hotel Statler will be available upon your return. A ticket for this event is included in your registration book.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WEDNESDAY, JUNE 25

8:30 A.M.—Registration, Ballroom Floor, Hotel Statler.

9:30 A.M.—Third Educational Session.

12:15 P.M.—Luncheon, Masonic Temple.
Busses will leave the Bagley Street entrance, Hotel Statler, starting at 12:15. This luncheon is for the men only and is being supplied gratis to the registrants by the job shop operators of Detroit and the surrounding territory. Guest speaker will be Edgar A. Guest. A ticket for this affair is included in the registration booklet.

2:30 P.M.—Fourth Educational Session.

6:30 P.M.—Dinner, Michigan Room, Hotel Statler.
This dinner is for the members of the National Association of Metal Finishers, Inc., only.

WEDNESDAY EVENING—
This evening is left open for all visitors to the Convention as a time for their personal activities.

THURSDAY, JUNE 26

8:00 A.M.—Breakfast Meeting of A.E.S. Research Committee, Ivory Room, Hotel Statler.
The activities of the Research Committee play an important part in the Annual Convention. The members of the Society and visitors should attend the sessions devoted to reports on the Research Committee Program and become better acquainted with the scope and activities of the various Research Projects. All members should familiarize themselves with the extensive work and planning required to institute and execute a Research Project. In many instances, the preliminary work involved is greater than the actual experimental work. Plan to attend the sessions of the Educational Program devoted to research activities. An exhibit showing the work and plans of the various projects is located at the Industrial Finishing Exposition.

8:30 A.M.—Registration, Ballroom Floor, Hotel Statler.

9:30 A.M.—Fifth Educational Session.
NOTE—This session is allocated exclusively to the Research Committee of the American Electroplaters' Society for reports upon the research activities.

2:00 P.M.—Annual Business Meeting, Grand Ballroom, Hotel Statler.
Final Business. Election of Officers. Selection of 1948 Convention City.

7:00 P.M.—Annual Banquet, Grand Ballroom, Hotel Statler.
Dinner, Floor Show, Dancing, Distribution of Awards. Contact Robert L. Redmond, Chairman of the Entertainment Committee, for table reservations.

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ACTUAL PHOTOGRAPH

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FRIDAY, JUNE 27

The entire day is provided to ensure ample time for every visitor to the Convention to see the Industrial Finishing Exposition at Convention Hall and make plant visitations according to his wishes. Throughout the week shuttle bus servce is provided at short intervals to Convention Hall. Shuttle busses will leave Hotel Statler at the Bagley Street entrance and will load and unload at the Cass Avenue entrance at Convention Hall.

Plant Visitations. A list of the various companies that have agreed to allow visitors of the American Electroplaters' Society Convention to go through their plants follows:

1. C. M. Hall Lamp Company.

Busses will leave Bagley Street entrance, Hotel Statler, 9:00 A. M. Visitors will be taken through the pressroom where they will be shown stamping operations on lamp bodies, reflectors, and other parts. The polishing and buffing room will be visited to show automatic and hand operations. The plating department will feature copper, nickel, chromium, cadmium, and zinc plating operations. Full automatic, semi-automatic and hand-operated equipment will be shown. Automatic plating equipment and barrel plating equipment can likewise be seen. Time required, 1½ hours.

2. Wyandotte Chemicals Corporation, Wyandotte, Michigan.

Busses will leave Bagley Street entrance, Hotel Statler, 9:00 A. M. Visitors will see the plant producing soda ash, with a description given of the processes and the flow of raw materials through the processes to the finished product. There are coke ovens where the visitors can see the loading and discharging of these huge ovens; there is a dry ice plant where dry ice is formed into blocks, cut and wrapped for shipment. Guides will be furnished to explain points of interest in the down-river area while busses are enroute to the Wyandotte Chemicals plant.

3. Cadillac Motor Car Compay, Detroit, Michigan.

Busses will leave Bagley Street entrance, Hotel Statler, 9:30 A. M. Visitors to this plant will see in operation a newly designed and installed plating plant incorporating the latest automatic equipment.

4. Ford Motor Company, Detroit, Michigan.

Busses will leave Bagley Street entrance, Hotel Statler, 9:30 A. M. Visitors will be shown the plating section in the rolling mill and the plating section in the motor assembly plant. A tour of the final assembly line will complete the trip, which will require two to two and one-half hours inside the plant.

5. Motor Products Company, Detroit, Michigan.

Busses will leave Bagley Street entrance ,Hotel Statler, 10:00 A. M. This plant is devoted to the production of automobile parts, including windshield frames, ventilator frames and other parts. Visitors to this plant will see manufacturing processes, including a very efficient automatic plating line.

6. Fisher Body—Ternstedt Division Plant No. 1.

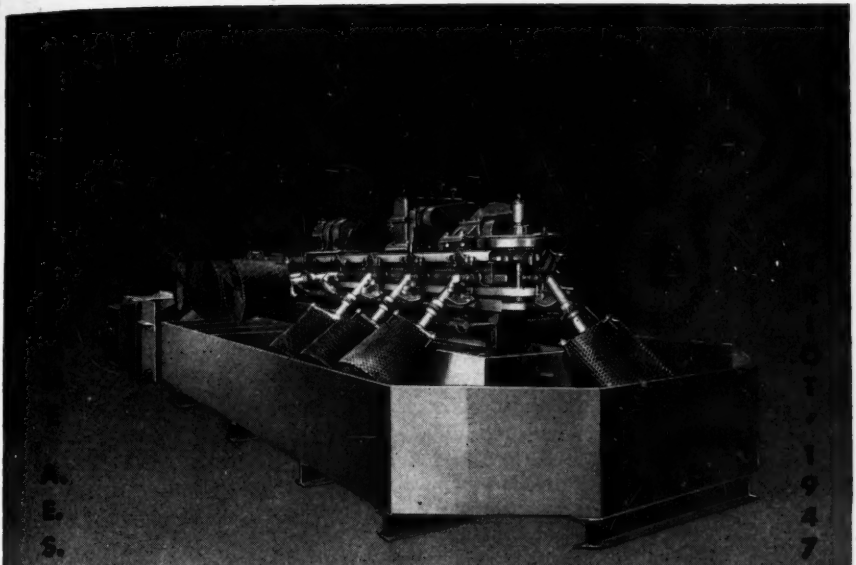
Busses will leave the Statler Hotel at 9:30 A. M. This large plating plant is devoted to the buffing and plating of steel, brass, and stainless steel automobile hardware. The equipment is mostly automatic. Time required, about 1½ hours.

7. Chevrolet Forge Division, Detroit, Michigan.

Visitors to this plant will see new chemical and metallurgical laboratories; shearing, hot forming, quenching and tempering of steel parts; spring forming-coil and other type springs; automatic copper-nickel plating line; nickel, buff and chrome plating line.

8. Pontiac Motor Car Company, Pontiac, Michigan.

In an area of about 1½ acres the Pontiac Motor Car Company has the largest industrial machine plating plant known. It is 660 feet long and capable of producing 22,500 square feet of copper, nickel and chrome each eight hours. Private escorts will be furnished for A.E.S. visitors and the Pontiac Motor Car Company will be host to a luncheon. Busses will leave Hotel Statler at 10:00 A. M. and return to Detroit about 3:00 P. M. Visitors will leave Pontiac about 2:00 P. M.



STEVENS "STANDARD" SMALL PARTS PLATING MACHINE

This machine, which will be exhibited at our booths (Numbers 31 to 37 and 52 to 58) at the June Exposition of the American Electroplaters' Society, is a standard, complete Full Automatic Small Parts or Barrel Plating Unit, built to meet the popular demand for a medium sized automatic installation.

Cleaning, acid treatment, rinses, plating, drying and automatic unloading operations are all incorporated in this machine.

Can be used for cadmium, zinc, copper, nickel or tin plating of small parts. Wide variations in the plating cycle can be had instantly by means of fully developed method of control.

Requires the services of one operator only to load the machine.

No overhead construction. Overhead hoists and duck boards eliminated, low operating and maintenance cost.

Our representatives will be there to give you full information on this and other Stevens Equipment and Supplies.

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Ladies' Program

SUNDAY, JUNE 22

3:00 P.M.—Registration, Ballroom Floor, Hotel Statler.

MONDAY, JUNE 23

10:00 A.M.—Trip through Greenfield Village with luncheon at the Dearborn Inn. Busses will leave Bagley Street entrance of the Hotel Statler starting at 10:00. A conducted tour lasting two hours through famous Greenfield Village will start upon arrival. You will be taken by bus to the Dearborn Inn for a 1:30 p.m. luncheon. Extensive plans have been made for making this trip most enjoyable. Return trip by bus from Dearborn Inn will start at 4:00.

TUESDAY, JUNE 24

8:30 A.M.—Plan to be at the WWJ broadcasting studio in the WWJ Building, 630 West Lafayette Boulevard by 8:30 a.m. for a special broadcast of the WWJ "Coffee Club" program. Special features on the program will be connected with the Convention.

WEDNESDAY, JUNE 25

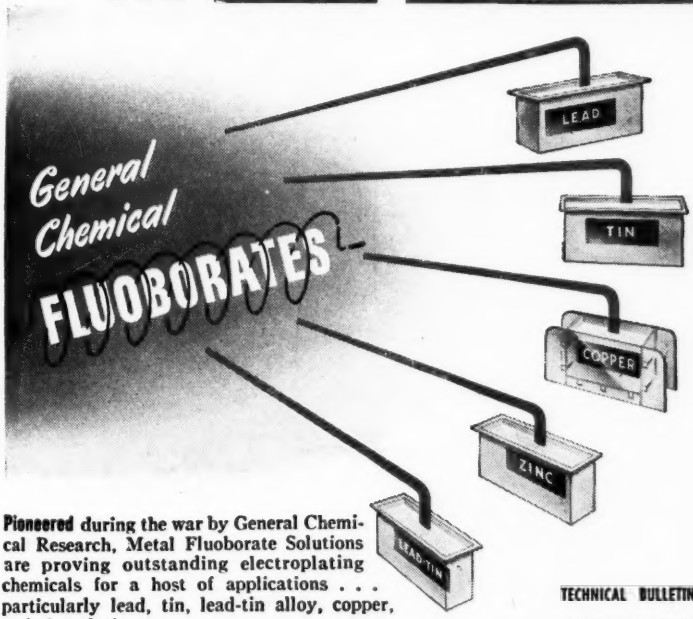
11:30 A.M.—Busses will leave the Bagley Street entrance of the Hotel Statler starting at 11:30 for a trip around Belle Isle and to the Detroit Yacht Club where you will be entertained with music, luncheon, entertainment features, and prizes. Your host will be the Wyandotte Chemicals Corporation and everything will be gratis. Busses will start the return trip at approximately 5:00.

THURSDAY, JUNE 26

8:30 A.M.—Breakfast at the J. L. Hudson Company store. This event will be long remembered by the ladies who attend. An extensive program is prepared for your entertainment. The J. L. Hudson Company's store is world famous and time will be allowed in latter part of the morning for going through the store.

NEW DEVELOPMENTS

FOR MODERN ELECTROPLATING!



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The Metal Fluoborates offer electroplaters a combination of features long desired but hitherto unobtainable in other plating agents:

1. Supplied in concentrated solution form . . . no mixing or dissolving necessary.
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3. Stability of bath composition.
4. Ease of control.
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8. Fine grained deposits of good color.
9. High speed operation.

Learn more about these new developments for modern electroplating without delay! Experimental samples are available from General Chemical Company, Fluorine Division, 40 Rector Street, New York 6, N. Y. As always, General Chemical's skilled technical servicemen are ready to give you complete details and every help in preparing for trial or full-scale runs.

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Technical Information Manual ZF-1—The New Approach to Zinc Plating.

Technical Information Manual LTF-1—Lead-Tin Alloy Plating from the Fluoborate Bath.

Technical Information Manual CF-1—Copper Fluoborate.

Educational Program

FIRST SESSION

Monday Afternoon, June 23, 2:00 P.M.

Grand Ballroom, Hotel Statler

CHARLES L. FAUST, Battelle Memorial Institute, Presiding

1—"Stress in Electrodeposited Nickel."
By A. K. GRAHAM and K. G. SODERBERG, Graham, Crowley and Associates.

2—"Stress in Electrodeposited Nickel."
By WM. M. PHILLIPS and F. L. CLIFTON, General Motors Research Division.

3—"Physical Properties of Electrodeposited Chromium."
By ABNER BRENNER, POLLY BURKHEAD, and CHARLES W. JENNINGS, U. S. Bureau of Standards.

4—"Bright Brass Plating of Zinc Base Die Castings."
By STANLEY J. BEYER, Hart Manufacturing Company.

SECOND SESSION

Tuesday Morning, June 24, 9:30 A.M.

Grand Ballroom, Hotel Statler

FLOYD OPLINGER, Du Pont de Nemours and Company, Presiding

1—"Modern Applications of Electroplating Solution Purification."
By B. C. CASE, Hanson-Van Winkle-Munning Company.

2—"Electroforming Pilot Static Tubes."
By ALFRED S. KASDAN, Kollsman Instrument Division of Square D Company.

3—"Chemical Deposition of Nickel and Cobalt."
By ABNER BRENNER and GRACE RIDDELL, U. S. Bureau of Standards.

4—"Recent Developments in the Use of Conversion Coatings on Zinc."
By J. E. STARECK and W. S. CIBULSKIS, United Chromium, Incorporated.

5—"Bulk Nickel Plating."
By HENRY STROW, Mac Dermid, Incorporated.

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Dust and fumes don't get a chance to circulate in plants equipped with a Schmieg CENTRI-MERGE Eliminator. The moment dust or fumes develop from buffing, burring, grinding, polishing, curing or any other processing operation, they are swept up on an air stream that carries them back through ducts to a central Collection Unit. In the washing chamber of this Unit the CENTRI-MERGE high pressure centrifugal water action literally *scrubs* every last vestige of contamination from the air stream—cleans it so thoroughly that, in many cases, it can be recirculated back into the plant. That's why users are so enthusiastic about what CENTRI-MERGE accomplishes. Protects both workmen and work.

Consult Schmieg engineers regarding your problems of dust and fume control.

THE *best* AIR PURGE *is* CENTRI MERGE

Schmieg INDUSTRIES INC.

Engineers & Manufacturers

THIRD SESSION

Wednesday Morning, June 25, 9:30 A.M.

Grand Ballroom, Hotel Statler

ARTHUR McNEIL, Mac Dermid, Inc., Presiding

1—Sound Film in Color, "Manufacturing Process for Standard Sixty-Inch Reflectors."
By ENGINEERING BOARD of Fort Belvoir, Virginia.

2—"Barrel Chromium Plating."
By GEORGE DUBPERNELL and S. M. MARTIN, United Chromium, Incorporated.

3—"Health Hazards in the Electroplating Industry."
By J. E. MOLOS, Industrial Hygiene Engineer, City of St. Louis, Missouri.

4—"Standardization of Buffing for Preparation of Atmospheric Exposure Test Panels."
By C. C. CUPPS, Standard Steel Spring Company; A. K. GRAHAM, Graham, Crowley and Associates.

5—"Evaluation of the Buffability of Nickel Deposits."
By R. D. MILLER, Bumper Division, Electric Auto-Lite; A. H. DuROSE, Harshaw Chemical Company.

FOURTH SESSION

Wednesday Afternoon, June 25, 2:30 P.M.

Grand Ballroom, Hotel Statler

E. T. CANDEE, Chairman of the Research Committee, Presiding

NOTE—This session is allocated exclusively to the Research Committee of the American Electroplaters' Society for reports upon the research activities.

1—Project No. 2, "Extraction Methods Applied to Electroplating Baths—Determination of Zinc and Other Impurities in Nickel Plating Solutions."
B. E. J. SERPASS, Lehigh University.

2—Project No. 4—"The Effect of Surface Finish of Non-Ferrous Base Metals on Protective Value of Plated Coatings."
By GEORGE I. KAHAN, U. S. Time Corporation.

3—Project No. 5—"Some Effects of Copper in Nickel Plating Solutions."
By D. T. EWING, Michigan State College.

4—Project No. 6—"Protective Power of Electrodeposits."
By N. THON, Princeton University.

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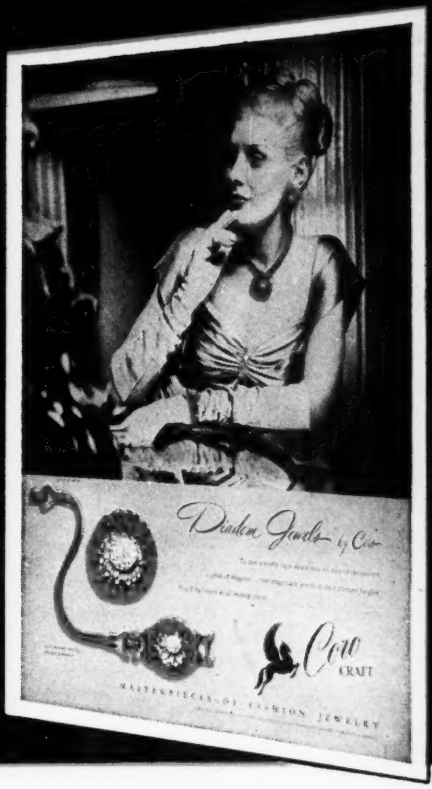

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FIFTH SESSION

Thursday Morning, June 26, 9:30 A.M.

Grand Ballroom, Hotel Statler

R. M. WICK, Vice Chairman, Research Directing Sub-Committee, Presiding

NOTE—This session is allocated exclusively to the Research Committee of the American Electroplaters' Society for reports upon the research activities.

1—Project No. 7, "The Evaluation of Methods for Determining the Thickness of Electrodeposited Coatings."
By HAROLD J. REED, Pennsylvania State College.

2—Project No. 8, "General Considerations of Experimental Methods for Determining Polarization."
By ALFRED L. FERGUSON, University of Michigan.

3—Project No. 9—"Physical Properties of Electrodeposited Metal."
By ABNER BRENNER, National Bureau of Standards.

4—Project No. 10, "The Present Status of Plating Room Waste Disposal."
By B. F. DODGE and D. C. REAMS, Yale University.

For
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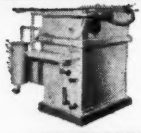
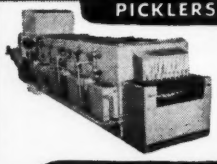
PICKLING and DRYING of METAL PARTS



DEGREASERS

PICKLERS



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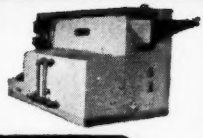
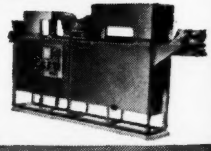


WASHERS

DRYERS



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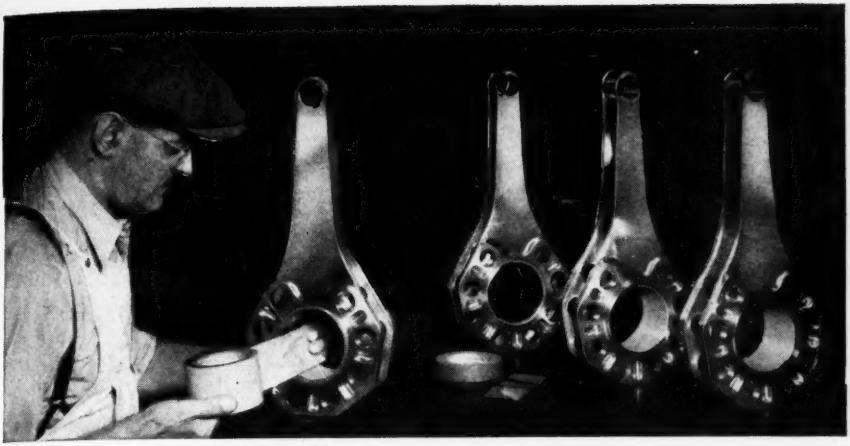

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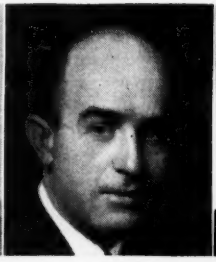

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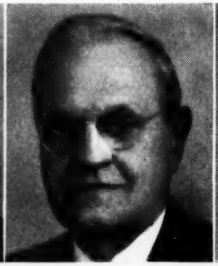

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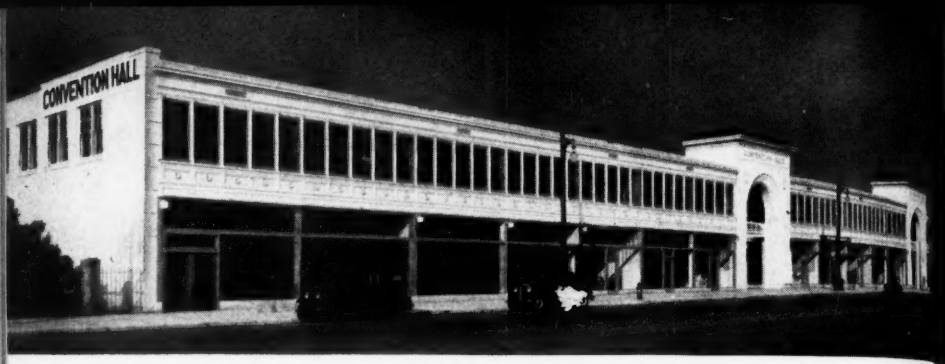


A. E. S.
INDUSTRIAL FINISHING EXPOSITION

The main feature of the American Electroplaters' Society's 34th Annual Convention is the Industrial Finishing Exposition at Convention Hall. Here, more than one hundred nationally known manufacturers and suppliers to the metal-finishing industry are exhibiting the latest metal-finishing and plating equipment, processes, materals, services, and plated products. This is the first exhibition to be conducted by the Society in eleven years and affords an opportunity for everyone connected directly or indirectly with the metal-finishing industry to see the results of the combined efforts of industry on display in one huge arena.

In order that the general public may become better acquainted with the use of plated products in their daily life, the Exposition is open to the public. One of the outstanding educational features of the Exposition is a completely equipped plating installation where souvenirs are to be plated and given to Exposition visitors. This plating plant consists of full-scale plant equipment to be operated under normal plant conditions. Fully automatic and semi-automatic plating and processing machinery are to be in operation in several booths and exhibitors have arranged to display full-scale production units. Automatic polishing and buffing equipment is also to be in operation. In connection with this

type of equipment, special emphasis is being placed on the application of buffing compounds. Both mechanical applicators and the latest spraying devices are to be shown.

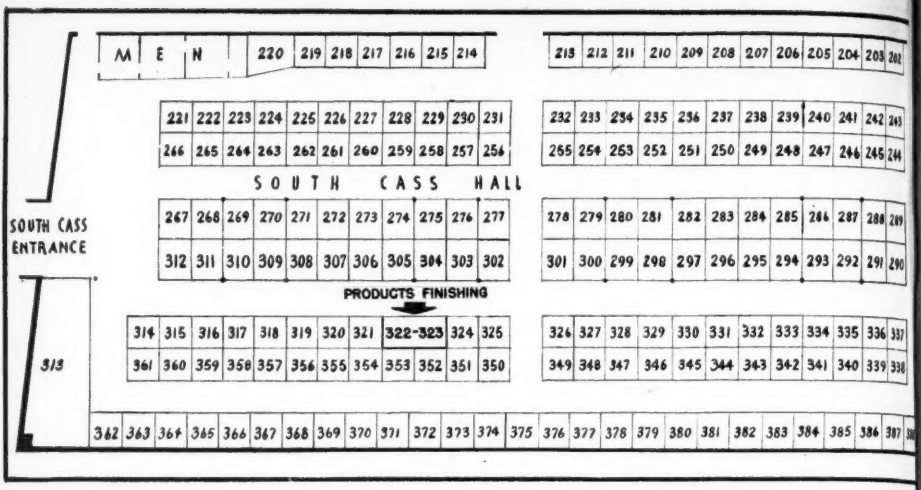
A graphic illustration of the largest plating installation in the world affords the feature of one important display. The complete operation of this huge plant is being shown in mural-style photographs and charts. Generator control or "current reversal" is to provide one of the feature attractions of a prominent display on recent developments in temperature, automatic fluid, or solution level controls.

Several principal generator and rectifier equipment manufacturers are to have their products on display, with representatives being present to explain the details of each product. The latest developments in copper and nickel baths and rustproofing solutions with their subsequent recent protective coating developments are being made available for investigation. For those interested in the protection of the "plating room tool," the plating rack, new rack coatings are to be displayed, as well as lacquers for special finishes. New cleaning developments, degreaser equipment and applications, complete filtering equipment and accessories are also being presented for examination. Safety engineers will be particularly interested in observing new methods and ideas for the handling of acids and other materials for safeguarding employees.

Truly, the Industrial Finishing Exposition is the mecca for A.E.S. members, process engineers and technicians, and all operating engineers and executives who, for the first time in over ten years, are afforded the opportunity of seeing, investigating, and discussing the latest developments and ideas of the complete metal-finishing industry. The Exposition is to be open to visitors at 1.00 p.m. Monday, June 23, to 10:00 p.m., Friday, June 27, according to the following schedule:

Date	Open	Close
Monday, June 23	1:00 p.m.	6:00 p.m.
Tuesday, June 24	1:00 p.m.	10:00 p.m.
Wednesday, June 25	1:00 p.m.	10:00 p.m.
Thursday, June 26	1:00 p.m.	6:00 p.m.
Friday, June 27	1:00 p.m.	10:00 p.m.

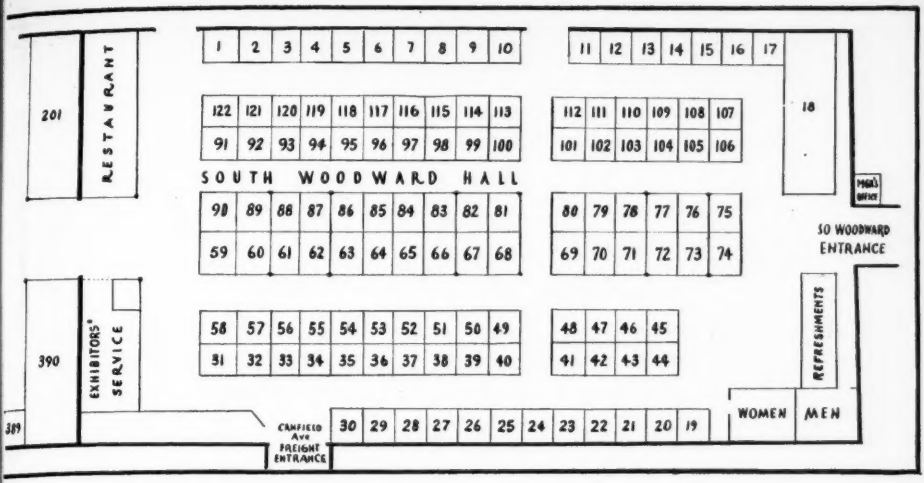
Admission is by trade ticket or 50-cent public admission charge. Each exhibitor has been furnished with a quantity of complimentary tickets for distribution to customers and prospects.



FLOOR PLAN OF

List of Exhibitors

Firm	Booth No.
Acme Manufacturing Co., Detroit, Mich.	39-40
Advance Plating Co., Inc., Detroit, Mich.	256-257
Advance Polishing Wheels, Inc. (Matchless Metal Polish Co.), Chicago, Ill.,	276
Aget-Detroit Co., Ann Arbor, Mich.	84
Alsop Engineering Corp., Milldale, Conn.	248
Aluminum Company of America, Pittsburgh, Pa.	223-224
American Buff Co., Chicago, Ill.	340
American Instrument Co., Silver Spring, Md.	316
American Rolling Mills, Middletown, O.	221-222
Auto City Plating Co., Detroit, Mich.	61
Automotive Rubber Co., Inc., Detroit, Mich.	249-250
Bart-Messing Corp., New York, N. Y.	261
Barwin Co., Oronoque, Conn.	19
Beacon Wiper Supply Co., Chelsea, Mass.	373
Behr-Manning Corp., Troy, N. Y.	317-318
Belke Mfg. Co., Chicago, Ill.	24-25
Blakeslee & Co., G. S., Cicero, Ill.	382
Bruce Products Corp., Detroit, Mich.	277



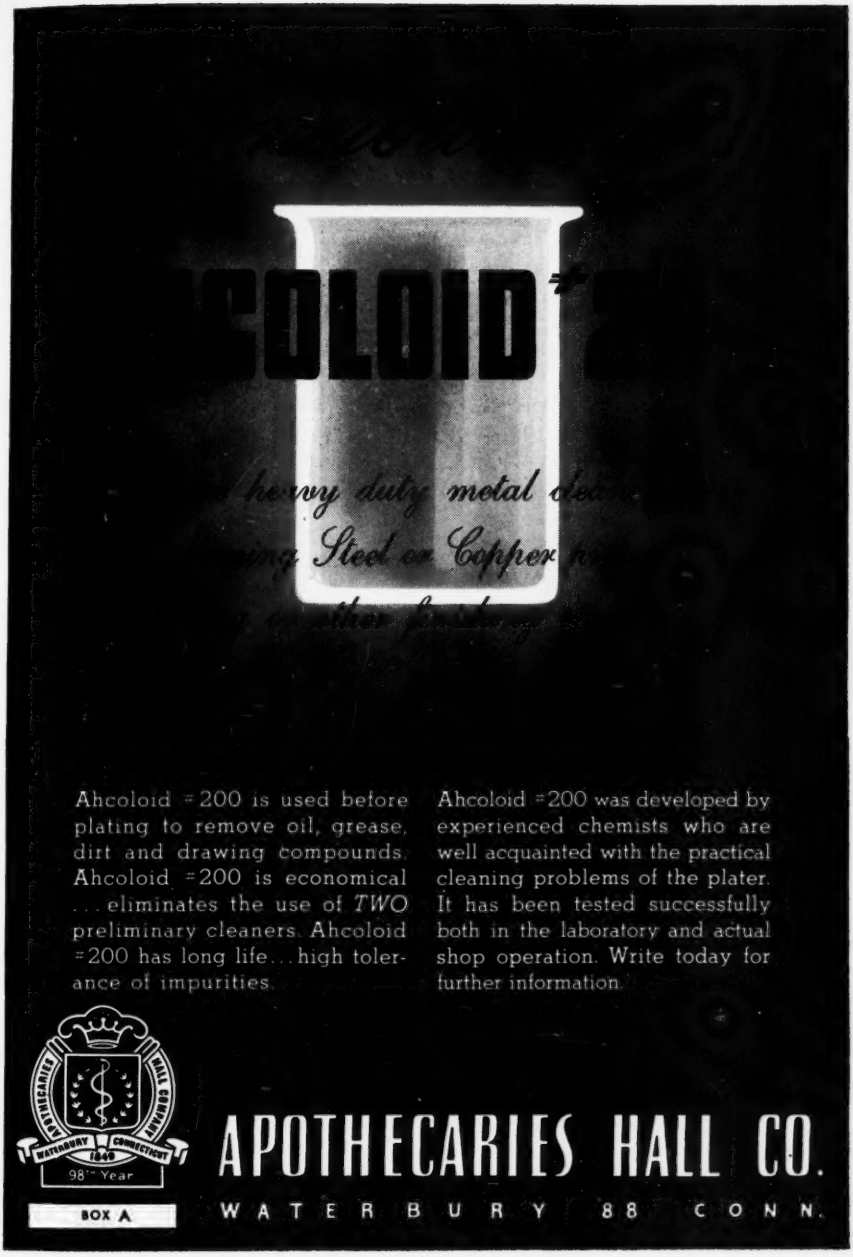
CONVENTION HALL

LIST OF EXHIBITORS—*Continued*

Firm	Booth No.
Buckeye Products Co., Cincinnati, O.	336
Buckingham Products Co., Detroit, Mich.	82
Bullard Co., Bridgeport, Conn.	205-206
Campbell Co., Inc., A. S., East Boston, Mass.	262
Chemical Corp., The, Springfield, Mass.	219
Codman Co., F. L. & J. C., Rockland, Mass.	22-23
Commercial Filters Corp., Boston, Mass.	90
Crown Rheostat & Supply Co., Chicago, Ill.	332-333
Darco Corp., New York, N. Y.	209
Detrex Corp., Detroit, Mich.	1-2
Detroit Chapter—American Electroplaters' Society, Detroit, Mich.	271-2-3-4, 305-6-7-8
Detroit Chemical Specialties Co., Dearborn, Mich.	321
Detroit Plating Industries, Detroit, Mich.	26
Die Castings (Technical Publishing Co.), Cleveland, O.	347
Diversey Corp., Chicago, Ill.	100
Division Lead Co., Chicago, Ill.	13
Douglas & Lomason Co., Detroit, Mich.	367
Dunn Products, Chicago, Ill.	266
Du Pont de Nemours & Co., E. I., Wilmington, Del.	85-86
Duriron Co., Inc., Dayton, Ohio	253

LIST OF EXHIBITORS—*Continued*

Firm	Booth No.
Eaton-Clark Co., Detroit, Mich.	337
Egyptian Lacquer Mfg. Co.. Newark, N. J.	81
Electric Products Co., Cleveland, O.	121-122
Electro-Tech Equipment Co., New York, N. Y.	264-265
Federal Telephone and Radio Corp., Newark, N. J.	111-112
Formax Mfg. Co., Detroit, Mich.	244-245
Fulton Sylphon Co., Detroit, Mich.	366
Gardner Publications, Inc., Cincinnati, Ohio	322-323
Gate City Plating Works, Kansas City, Mo.	231
General Chemical Co., New York. N. Y.	371
General Electric Co., Bridgeport, Conn.	280-281
Gerity-Michigan Die Casting Co., Adrian, Mich.	232-233
Green Electric Co., Inc., W., New York, N. Y.	50
Gumm Chemical Co., Inc., Frederick, Kearny, N. J.	20-21
Hammond Machinery Builders, Inc., Kalamazoo, Mich.	65-66-67-68
Hanson-Van Winkle-Munning Co., Matawan, N. J.	201
Harding Manufacturing Co., Inc., Detroit, Mich.	10
Harshaw Chemical Co., Cleveland, Ohio	350-351-352
Haveg Corp., Newark, Del.	296
Heil Process Equipment Corp., Cleveland, Ohio	361
Houdaille-Hershey Corp., Detroit, Mich.	93
Iding Disc Grinding Compound Co., Inc., M. P., Milwaukee, Wis.	325
Industrial Electroplating Co. (Niehaus Engineering Co.), Indianapolis, Ind.	217
Industrial Filter & Pump Mfg. Co., Chicago, Ill.	375
International Nickel Co., Inc., New York, N. Y.	390
Ion Industries, Inc., Chicago, Ill.	208
Iron Age, The, New York, N. Y.	251-252
Knight Plating Co., Detroit, Mich.	378
Lasalco Inc., St. Louis, Mo.	113-114
Lea Mfg. Co., Waterbury, Conn.	59-60
L'Hommedieu and Sons Co., Charles F., Chicago, Ill.	235-236
Maas & Waldstein Co., Newark, N. J.	17
Mac Dermid Inc., Waterbury, Conn.	376-377
Mahoney, R. C., 1540 Anna Pl., Detroit, Mich.	214
Mall Tool Co., Chicago, Ill.	96
Manderscheid Co., Chicago, Ill.	242-243
Manufacturers Processing Co., Detroit, Mich.	3
McGean Chemical Co., Cleveland, O.	202-203
Meaker Co., Chicago, Ill.	282-283
Metal Finishing (Metal Industry Publishing Co.), New York, N. Y.	107
Michigan Abrasive Co., Detroit, Mich.	88-89
Michigan Chrome & Chemical Co., Detroit, Mich.	49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BOX A

LIST OF EXHIBITORS—*Continued*

Firm	Booth No.
Miller Co., J. C., Grand Rapids, Mich.	328-329
Milwaukee Motive Mfg. Co., Milwaukee, Wis.	324
Modern Hard Chrome Service Co., Detroit, Mich.	62
Modern Machine Shop, Cincinnati, O.	322-323
Monthly Review, The, and A.E.S. Research Committee	15-16
Murray-Way Corp., Detroit, Mich.	302-303
Nankervis Co., George L., Detroit, Mich.	284-295 inclusive
Nelson Chemicals Corp. (Gripmaster Div.), Detroit, Mich.	326-327
Oakite Products, Inc., New York, N. Y.	212-213
Oficina Mecanica Moderna, Cincinnati, O.	322-323
Parker Rust Proof Co., Detroit, Mich.	338-339
Plating Institute, The (National Association of Metal Finishers, Inc.), Detroit, Mich.	104
Products Finishing, Cincinnati, O.	322-323
Promat Div., Poor & Co., Waukegan, Ill.	365
Rhodes & Co., James H., Chicago, Ill.	105
Richardson-Allen Corp., New York, N. Y.	234
Schneible Co., Claude B., Detroit, Mich.	348-349
Shields Co., Wm. R., Detroit, Mich.	246-247
Siefen Co., J. J., Detroit, Mich.	254-255
Solventol Chemical Products, Inc., Detroit, Mich.	97-98
Sparkler Manufacturing Co., Mundelein, Ill.	314-315
Special Chemicals Corp., New York, N. Y.	374
Standard Electrical Tool Co., Cincinnati, O.	83
Standard Plating Rack Co., Chicago, Ill.	108
Stevens, Inc., Frederic B.	31-38 and 51-58 inclusive
Sturgis Products Co., Sturgis, Mich.	87
Sulphur Products Co., Inc., Greensburg, Pa.	110
Taller Mecanico Moderno, El, Cincinnati, O.	322-323
Tex-Rite Products Co., Detroit, Mich.	218
Trerice Co., H. O., Detroit, Mich.	330-323
Udylite Corp., Detroit, Mich.	69-80 Inclusive
United Chromium, Inc., New York, N. Y.	101-102-103
United Platers, Inc., Detroit, Mich.	388
U. S. Stoneware Co., Akron, O.	278-279-300-301
Wagner Brothers, Inc., Detroit, Mich.	362-363
Wagner Co., A. T., Detroit, Mich.	334-335
Waverly Petroleum Products Co., Philadelphia, Pa.	364
Wico Metal Products Co., Van Dyke, Mich.	63
Wyandotte Chemicals Corp., Wyandotte, Mich.	106
Wyandotte Paint Products Co., Wyandotte, Mich.	99
Zapon Div., Atlas Powder Co., Wilmington, Del.	210-211

E

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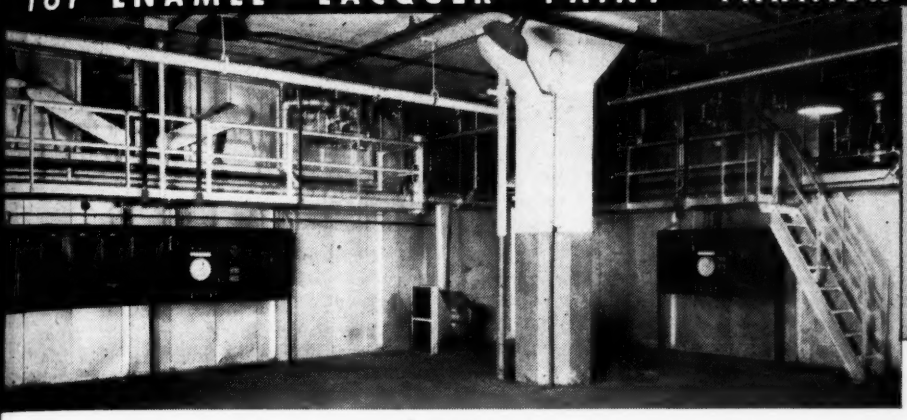

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AHON

Barrel Finishing of Metal Products

Part 10—Factors in the Evaluation of Steel Burnishing Materials

By H. LEROY BEAVER
Barrel Finishing Consultant
Lansdale, Pennsylvania

IN any group where barrel finishing procedure comes up as a subject for discussion, sooner or later the point of the relative efficiency of the various sizes of steel balls is debated. Therefore, in this discussion we are first going to present to you a diagram, as shown in Fig. 1, which serves to illustrate the points of burnishing contact made by four sizes of balls.

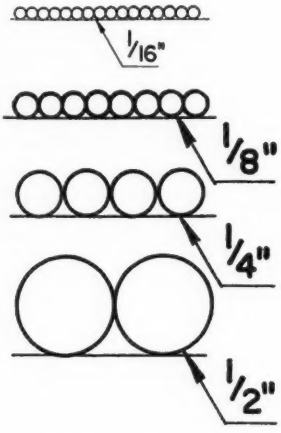

Fig. 1 — Diagram illustrating the points of burnishing contact made by four sizes of balls

You will note that we show 1/16-inch balls as supplying 16 points of contact per inch of space covered, ⅛-inch balls 8 contacts, ¼-inch balls 4 contacts, and ½-inch balls 2 contacts. Thus, it is logical to assume that, if a 1/16-inch ball makes double the number of contacts than a ⅛-inch ball, it must be exactly twice as efficient; that if a ⅛-inch ball makes 8 points of contact per inch of area, it surely must be twice as efficient as a ¼-inch ball which makes only 4 points, and that if a ¼-inch ball makes 4 points of contact, it must be twice as efficient as a ½-inch ball which makes only 2 points of contact per inch of area covered. Insofar as merely judging ball efficiency by relative diameters or one size against another, it may be well and good, but when this is done we have always noted that little or no attention is ever paid to the fact that as the ball diameter increases in size, the cubic content factor also increases and at a much greater rate than the relative diameter differences.

Irrespective of the style or size of barrels that you use, all are designed to carry a nominal average load in pounds of steel burnishing balls regardless of the size of balls, and,

whether the load be 50 or 1000 pounds, it must be remembered that all of the balls in the popular size range will bulk the same; that is, 12½ pounds per quart or 100 pounds per peck. You cannot possibly have more contacts per inch of surface covered than there are balls in each pound of a given size, thus, we will present a table which shows the number of balls per pound in the range of sizes from 1/16 to ½ inch:

Size	Number of Balls (Number of Contacts) per pound
1/16"	27,904
3/32"	8,264
1/8"	3,474
5/32"	1,778
3/16"	1,029
7/32"	648
1/4"	434
5/16"	222
3/8"	129
7/16"	81
1/2"	54

and then to illustrate further how the efficiency curve deteriorates we will jump from a ½-inch ball with its 54 points of contact and which, of course, would be said to be twice as efficient as a 1-inch ball to show you this

1" 6.78

In the food service field, the ball mixture generally used consists of equal parts of ⅛, 5/32, and 3/16-inch balls which provide an average of 2,093 points of contact per pound of burnishing material. However, if the 5/32 and 3/16-inch balls were eliminated from this mixture and all ⅛-inch balls were used, an immediate gain of 1,400 points of contact per pound of materials would be effected.

When some of these various sizes of balls are placed side by side, the comparison seems to be almost ridiculous, as you will note by the two simple line sketches shown in Fig. 2. While the comparison is shown clearly enough by two simple circles, if you

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were to hold in your hand a finished and polished ¼ and 1-inch steel ball, the comparison would be even more marked and, incidentally, more confusing. Often, when we are planning to join a group discussion, we slip two such balls into our pocket and pass them around for estimates of their relative size. You would be surprised at the wide variety of guesses and coming from men who have worked with burnishing balls just about all of their business lives. Surely, it can be hardly argued that a ¼-inch ball with its 434 points of contact per pound of material is four times as efficient as a 1-inch ball which can only show 6.78 points of contact per pound of material.

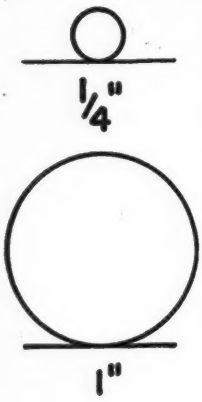

Fig. 2—Sketch showing the comparative sizes of a ¼-inch and 1-inch burnishing ball

Perhaps, if you will refer back to the table presented previously, it will help many of you who have written to us from time to time regarding the effectiveness of various burnishing mixtures to understand why we always seem loathe to recommend materials larger than ¼-inch. This is only due to the importance we place on the points of burnishing contact to be obtained from each pound of materials operated in the barrel, since even with the slight increase from ¼ to 5/16 inch we have 434 points of contact as against only 222.

We should note exceptions, of course, when they exist and they do in this evaluation due to the fact that when soft balls are used with abrasives for the reduction of surface area, we have often recommended balls of the size range from 5/16 to ½ inch but only in their soft state because these soft balls, when operated with abrasives, will be reduced in size in direct ratio to the reduction in size of the parts under operation by the removal of surface area. As the balls are reduced, the load, of course, becomes lighter and we are required to feed in additional quantities in order to maintain our maximum load and to also gain the best values in surface removal.

At this point, we should pause to explain another matter that might have been more or less confusing to some of our readers by the manner in which the phrases were used in describing barrel finishing materials. In connection with the use of unhardened balls or other shapes, we have at times used the terms "soft barrel finishing material" and then at other times "dead soft annealed barrel finishing materials." These two designations are very definitely not to be regarded as a distinction without a difference since they do not refer to the same materials but to two separate and distinct types. "Soft burnishing materials" are balls that are simply headed, the flash removed, then tumbled smooth and shipped to you in that condition. Inasmuch as they require no heat treatment their cost is generally somewhat less than regular materials.

"Dead soft annealed barrel finishing materials," however, have relation to something entirely different, for after blanking or forming, flashing, and tumbling to a smooth finish, the balls are then subjected to a heat treatment which by retarded cooling produces a ball generally described as "dead soft." Balls of this type instead of selling for less generally carry on additional 10 per cent annealing charge.

In their application, the soft balls as first described are invariably used in conjunction with some variety of abra-

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The camera does not detect soil on this metal, photographed under daylight. But look at the same plate—at the right!

U. V. LIGHT SHOWS UP INVISIBLE DIRT

Fluorescent Oil evaluation reveals definite soil when the same plate as at left is photographed under ultra-violet light.

(Photos Houghton Lab.)

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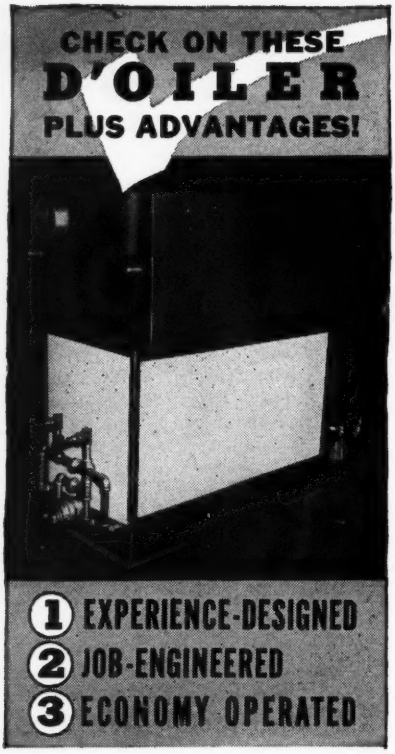

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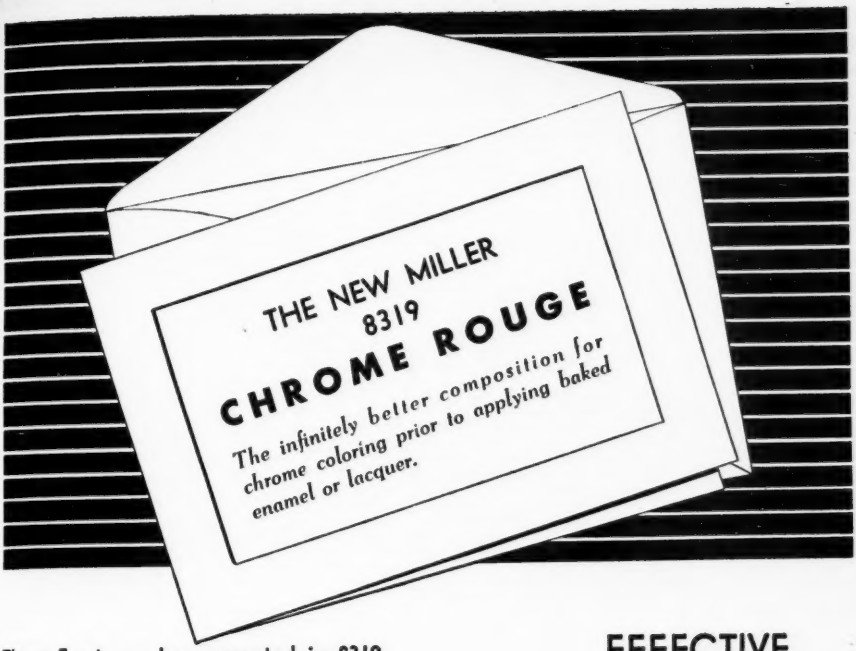
sive material, while the "dead soft" are used alone, principally when operated on stampings for the removal of burrs. An exception might be noted here also since the dead soft balls seem to be especially effective when used in conjunction with Vienna Lime for the barrel polishing of hardened steel parts, as might be evidenced by the fact that during the peak of the war production period one of our largest manufacturers of radial and thrust ball bearings had in continuous operation a total of sixteen tons of dead soft balls in its barrel setup which gave them a production increase of better than 35 per cent over any previous methods. It is a rather peculiar phenomena that we would have some difficulty in attempting to explain, but soft balls as such and hardened and polished balls are far less efficient when used in lime operations than the dead soft annealed variety.

We have said considerable in this discussion regarding points of contact per pound of materials and perhaps we should explain that the point of contact of a ball is generally represented by a dot, and that this dot supposedly represents a line equivalent to approximately 0.0001 inch. Thus, literally millions of these contacts are required to cover every part of the surface area of parts in process, which makes it all the more important to select such materials that provide the maximum rather than the average or minimum number of contacts per pound of materials operated.

In the ball bearing field, while the point of bearing contact with the raceways is also represented by this selfsame dot, an exception is noted since, when a ball bearing is operating under heavy stress or maximum load, the balls, which of course differ materially in character from burnishing material, are heat treated in such a way that they are resilient as well as tough, and, when under heavy load, can be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distorted "out of round." When in this state, the point of contact changes and is represented by an elipse. Fig. 3 provides a comparison between a dot and an elipse in enlarged form.

There are some who have attempted

Fig. 3—Sketch illustrating the comparison between a dot, representing the point of contact of a bearing ball with the raceways under light load, and an elipse in enlarged form, representing the point of contact of a bearing ball distorted under heavy load

to bring this same reasoning to bear in the matter of the contacts obtained in the average burnishing barrel, claiming that sufficient stress is created to provide this broader line as represented by the eliptical point of contact. We would most certainly question this because if we took all of the average barrels in use in this country and checked the quantity of burnishing material in the average barrel, we would find it to run somewhere between 300 and 500 pounds. From this we might go directly to the tables of load carrying capacities as specified by the Navy Department and from which we will give you only three sizes that should completely suffice:

Size	Load (Pounds)
1/8"	1,100
3/16"	2,300
1/4"	4,200

If we should take for instance the 3/16-inch size ball which is the most popular and most sought after in all of our production planning using barrel finishing procedure, it is difficult to see, even if every operator used 30 x 16-inch barrels which are operated with a nominal load of 1,000 pounds, how sufficient pressure could be developed to a point just below 2,300 pounds where the eliptical contact would be effected. Thus, we might rather well dismiss any such claim as the above as being more or less a figment of the imagination and mechanically impossible of accomplishment.

All of the foregoing discussion, of course, has had reference to balls and the relation of points of contact per pound of material. At this point, we should perhaps devote some of our discussion to the formed burnishing pieces such as Balcones, Finbals, Diagonals, Diamonstels, and Double Cones. The contacts on these formed pieces are accomplished in a different manner than with balls, since all of them are designed for the obtaining of a

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definite result in barrel finishing practice and have been, for the most part, designed to effect contact in angles and grooves where even the smallest balls could not reach and for the equally important purpose of setting up a greater resistance in the burnishing mass to the parts seeking to pass through it. Generally speaking, their number of points of contact per pound of material may be considered as being the same as the next size larger ball than the designated size of the formed piece; in other words, a 3/16 x 3/16-inch diagonal polishing steel would be about equivalent in weight to a 7/32-inch ball.

We have been asked many times down through the years to provide a history of the various steel burnishing materials used in barrels, including their origin, the names of individuals responsible for them, and the purpose sought to be served by their use. We plan to have such information ready for you sometime this fall.

"Deoxidine." The American Chemical Paint Co., Ambler, Pa., has issued a four-page illustrated folder descriptive of a phosphoric acid metal cleaner and rust remover known as "Deoxidine." The folder discusses several different types of Deoxidine, including their selection and application. Copy free upon request.

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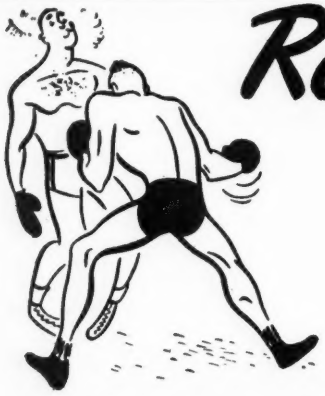

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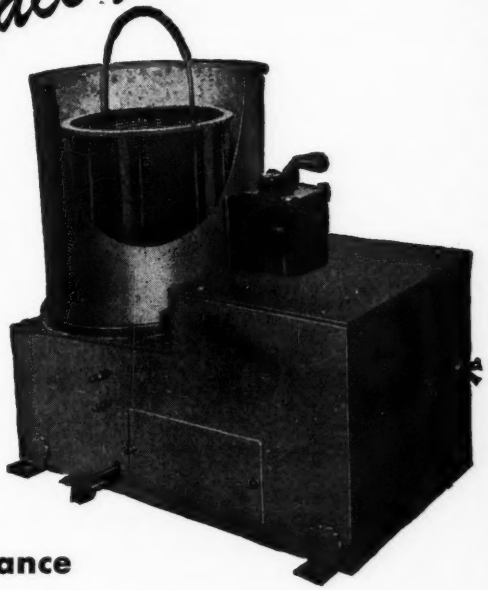

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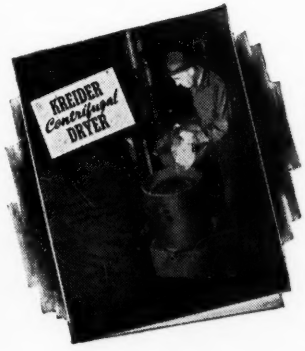

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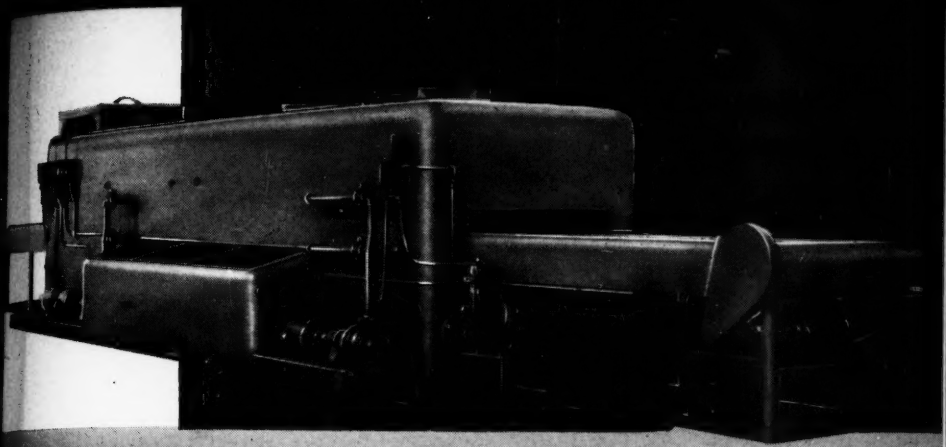
Production Efficiency in Decorative Chromium Plating Requires Correct Equipment

THE growing interest in tarnish-resistant decorative chromium plate as a final finish to an undercoat of copper-bright nickel will undoubtedly continue in the production finishing of many types of metal articles. The production man in the finishing department, when surveying the overall efficiency of this phase of the finishing operation, should keep in mind the fact that perhaps in no other part of electroplating work is the use of proper type of equipment so essential to efficient production.

Due to the relatively high current densities used in chromium plating, all parts of the circuit must be sufficiently large to carry the amperage required without overheating. In general, one square inch of copper cross section should be allowed for each 1,000 amperes of current carried ("Modern Electroplating"). A typical size and arrangement of bus bars are shown in Figs. 1 and 2.

Insoluble lead anodes are widely used in chromium plating from chromic acid baths. The film of lead peroxide which forms on these anodes during use is reported to effect a continuous re-oxidation of the trivalent chromium to chromic acid, thereby maintaining its concentration at a desirable low value. Anodes of chemical lead can be used, but they are slowly attacked by the solution and cause the formation of excessive amounts of lead chromate sludge. Antimonial lead is preferable to chem-



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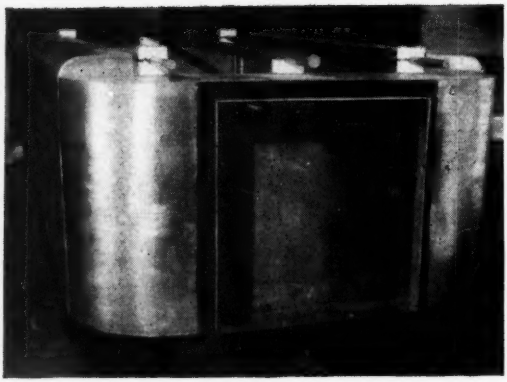

Fig.2 — Typical lead-lined lead-coated chromium plating tank (*Photo courtesy Heil Process Equipment Corp.*)

ical lead because of its greater corrosion resistance and strength.

Lead and lead alloy anodes of varying cross-section have been employed from time to time, however, for most types of decorative plating, ordinary flat anodes are satisfactory. Sometimes a "sawtooth" design is employed to increase the effective anode surface area. In general, it is preferable to use a number of narrow anodes rather than a single wide sheet, since in this way more uniform current distribution is obtained. Thick anodes should be used to conduct the high currents required for chromium plating. Anodes that are too thin will overheat in use and tend to corrode and warp.

Tanks for chromium plating have for many years been made of lead-lined steel. Antimonial lead linings have been widely used because of their unusual corrosion resistance in chromic acid solutions. Acidproof brick linings have been found very satisfactory for chromium plating tanks made of steel. This type of lining has excellent resistance to the corrosive action of the plating bath in addition to the added advantage of being a non-conductor, thereby eliminating stray current effects. The life of such linings, when due precautions are observed to avoid accidents, is almost unlimited. Synthetic lining materials are also available for chromium tanks which, because of their insulating value, will eliminate stray current effects.

Proper temperature controls are important for consistently satisfactory operation of chromium plating baths. The components of one satisfactory system of control that has been devised are shown in Fig. 3 (see also "Metal Progress," February 1947). This system includes a proportioning pneumatic thermometer controller

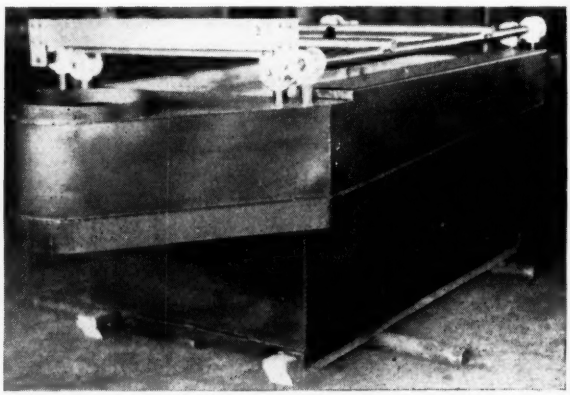

Fig. 1 — View of acidproof ceramic-lined chromium plating tank showing size and arrangement of bus bars (*Photo courtesy Heil Process Equipment Corp.*)

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(reverse acting, 10 per cent throttling range) with a mercury filled, antimony-lead covered, thermal system and two split-spring type, diaphragm motor, control valves. The preferred range of the thermometer is 50 to 200 deg. F. One of the two valves is for steam service and is set so as to be fully closed at about 7½ lb. air pressure and fully open at 14 lb. The other valve is for cooling water control and is adjusted to be fully open at 1 lb. and fully closed at about 7 pounds.

The thermometer indicates and records the temperature of the bath and automatically operates steam and cooling water valves to maintain a constant temperature. When the bath temperature is below the manually adjusted set point of the instrument, steam is admitted to the coils; when the temperature is above this point, cooling water is admitted. Both valves are closed when the temperature reaches the desired point. The proportioning action of the controller gradually decreases the steam of water as the temperature approaches the set point and prevents overshooting.

Care should be taken to install the temperature control instrument where it will not be damaged by corrosive vapor from the plating bath. Correct placement of the bulb is also important. The bulb should be sufficiently remote from the heating coils and the side of the tank to detect a true average tank temperature, but must not be located in a position where it is likely to be damaged when work is placed in or removed from the tank. In some installations, an open-ended sheath for the bulb is desirable. The bulb should not be located between the anodes and the work due to the fact that it may become an intermediate electrode during the plating process. Usually, the best location for this type of temperature control is between the anodes and the tank wall.

The large volumes of hydrogen and oxygen evolved during chromium plating cause a chromic acid spray to be given off which, if permitted to escape into the plating room, is irritating and corrosive to the mucous membranes of the nose. This spray, therefore, requires removal to protect the workmen, and adequate exhaust facilities must be provided for this purpose. Figure 4 shows a moisture extractor for installation on the tops of buildings housing chromium tank ventilators. The extractor is used to collect the chromic acid from the fumes being exhausted and return it to the plating tank.

The production man in the finishing department will find that proper attention given to equipment and operating details in decorative chromium plating will yield dividends in the increased efficiency in this particular department.

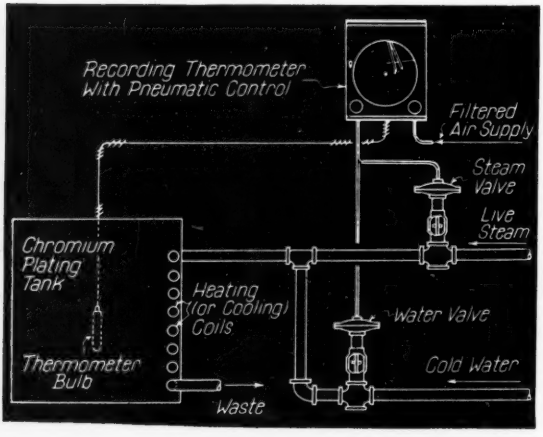

Fig. 3 — Diagram showing one system of temperature control recommended for chromium plating tanks (*Illustration courtesy "Metal Progress"*)

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THIS QUICK QUIZ EXPLAINS HOW G-E INDUSTRIAL INFRA-RED LAMPS CAN SPEED PRODUCTION IN YOUR PLANT

QUESTION: What is an infra-red lamp?

ANSWER: It is an incandescent lamp designed especially to produce controlled radiant energy for such industrial processes as drying, heating, curing, baking and dehydrating.

QUESTION: How do infra-red lamps work?

ANSWER: General Electric industrial infra-red lamps produce heat quickly, cleanly, economically. Heat is generated *within* the material being processed.

QUESTION: For what purposes is infra-red used?

ANSWER: Drying paint and other finishes, preheating plastics, baking ceramic products, dehydrating raw materials, curing rubber sheets, etc.

QUESTION: Is infra-red equipment costly?

ANSWER: No. Ovens are simply constructed and easy to install. G-E Industrial Infra-red Lamps are moderately priced, last a long time (average life 5000 hours).

QUESTION: Can ovens be adapted to suit special needs?

ANSWER: Yes. Equipment is compact, movable—easily arranged to suit large or small production line operations. General Electric lamps are available in various types and wattages to give exactly the right amount of heat.

QUESTION: Can employes operate infra-red ovens in comfort?

ANSWER: Yes. There's no excessive heat around ovens because radiation is focused directly on the work.

QUESTION: Where can you get full information?

ANSWER: Consult a recognized infra-red oven manufacturer, or call your nearby General Electric Lamp Office.

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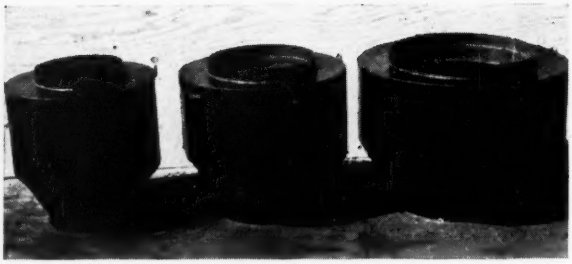


Fig. 4—One type of moisture extractor for use on tops of buildings housing chromium plating tanks. Chromic acid is collected from fumes and returned to plating tanks. (*Photo courtesy Heil Process Equipment Corp.*)

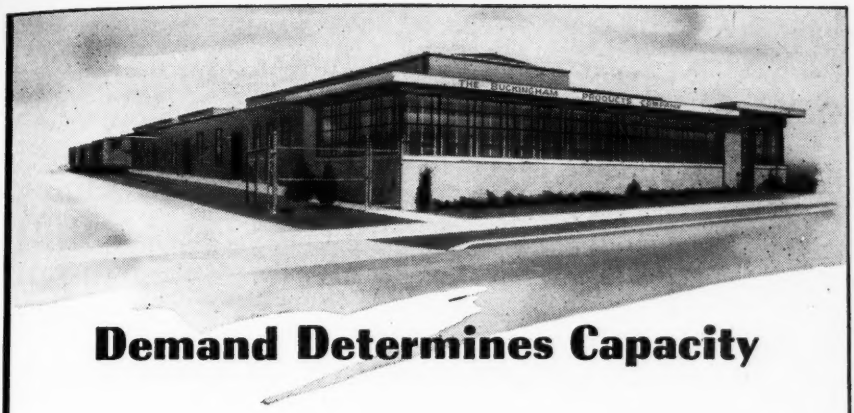
Factors Affecting the Efficiency of Metal Cleaning

THE metal-finishing engineer who has encountered difficult cleaning problems may be interested in the results of recent fundamental work reported from Frankford Arsenal by Samuel Spring and Louis F. Peale in which it was found that many commercial cleaning processes based on the hypothesis that emulsification and saponification are the important primary processes may be very inefficient (see also "Metal Progress," January 1947). Thus, the rejection of the saponification hypothesis makes the widely used practice of adding larger quantities of alkaline salts or more alkaline salts to cleaning tanks for the purpose of increasing the saponification of oil a rather inefficient one. Spring and Peale pointed out one instance in which so much alkali was added to a metal cleaning tank that it formed a layer one foot deep on the bottom of the tank, yet did not result in very much improved cleaning. A much favored practice would have been to add a surface-active agent which could undercut the oil globules and reduce the attraction for metal rather than attempt to saponify it by the addition of strong alkaline salts.

Another widely used commercial practice is based on the emulsification hypothesis in which it is assumed that when oil appears on the surface of the bath the emulsification powers have been lost and it is necessary to change the bath. Considerable data accumulated in both the laboratory and shop at Frankford Arsenal have indicated that cleaning, particularly of mineral oil, can be effectively continued so long as the oil is removed from the work, independent of whether a layer of oil is on the surface or not. Thus, from this viewpoint, the life of many cleaning solutions may be considerably increased.

These conclusions on metal cleaning by Spring and Peale are based on direct visual and photographic observations, some of which were carried out under the microscope, of the process of oil removal from metal. Observations under the microscope have indicated that the removal of oil from metal occurs in a series of stages that may be listed as follows: (1) shrinkage of the oil film; (2) expulsion and gathering of much of the oil; (3) oil globule formation; and (4) removal of the oil globule. According to these observations, the final and perhaps the most critical stage of the cleaning process involves the gradual reduction of the base of the globule so that a perfect sphere is formed, following which the sphere is released from the surface. All of the oil is removed from the surface with the release of the globule, leaving the surface "chemically clean."

Thus, on the basis of the above step-wise mechanism proposed by Spring and Peale, it is easy to see why the viscosity of the oil should be an important factor in determining the



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efficiency with which it can be removed. In fact, it appears from data presented that the viscosity of an oil is a more important factor in its removal than the thickness of the oil film.

Experimental conclusions showed that sodium hydroxide is less effective than weaker alkalies, such as the silicates, in metal cleaning operations. Also, the fact was brought out that mineral oil, which is not saponifiable, is adequately removed by natural surface active agents, in contrast with mineral oil which is not adequately removed under this condition.

Thus, the experimental approach to the problem made by Spring and Peale furnishes an explanation of the well-known influence of alkaline salts in metal cleaning, without assuming that these salts function in a chemical reaction (saponification) or act as intensifiers (synergists) in emulsification. Since the effect of the alkali is to reduce interfacial tension, which is an important factor in the shrinkage of the oil film and globule formation, it is not necessary to specify other actions for the alkali. This concept also permits an explanation of why surface-active agents, which also reduce interfacial tension, can be substituted for alkaline salts. In addition, the data such as presented in Fig. 5 provide some explanation for the poor performance of other alkalies relative to the silicates, since the silicates were found to be more effective in reducing interfacial tensions at low concentrations than the the other alkalies.

* * *

Use of Proper Strike Important in Plating on Zinc Base Die Castings

AMONG the important factors that were emphasized by C. F. Nixon of the Ternstedt Division, General Motors Corporation, in discussing "Plating on Zinc Base Die Castings" before the Annual Educational Session of the Detroit Branch, American Electroplaters' Society, was that the use of the proper initial "strike" solution under proper operating conditions is very important in ensuring the success of the plating operation.

The "strike" solution recommended by Nixon (Fig. 6) consists of 2½ to 3 oz./gal. of copper cyanide and ¾ to 1 oz./gal. of free cyanide. In addition, 1 oz./gal. of sodium hydroxide is added and from 4 to 6 oz./gal. of Rochelle salts are added to ensure proper anode corrosion. The solution temperature is maintained at 100 to 115 deg. F. Some steel anodes are used with the copper anodes in sufficient quantity to prevent rise in copper concentration. It is important, according to Nixon, that the copper content be

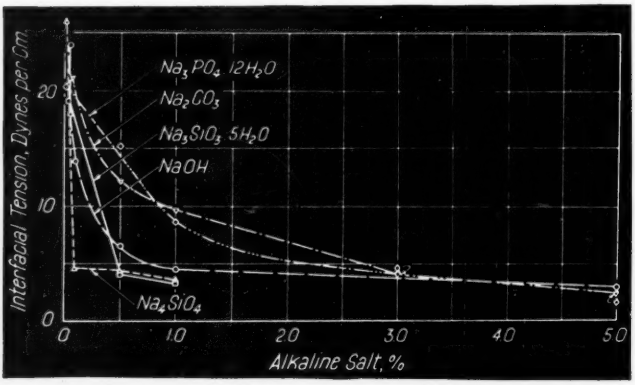

Fig. 5 — Chart showing effect of certain alkaline salts in reducing interfacial tension between mineral oil and water (*Illustration courtesy "Metal Progress"*)

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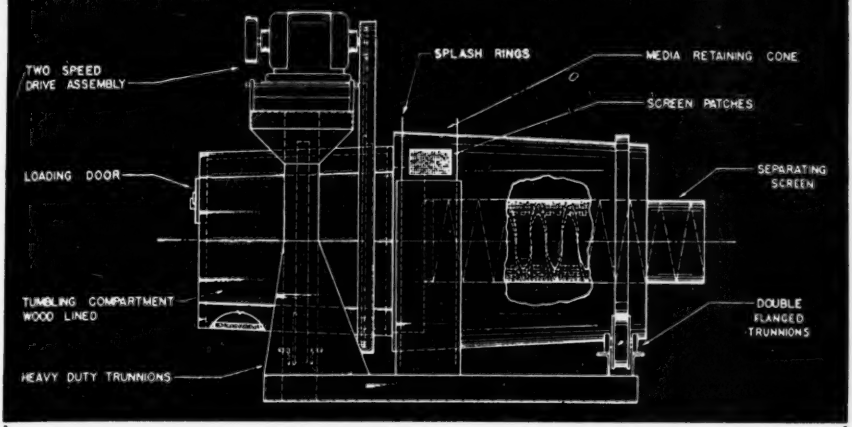

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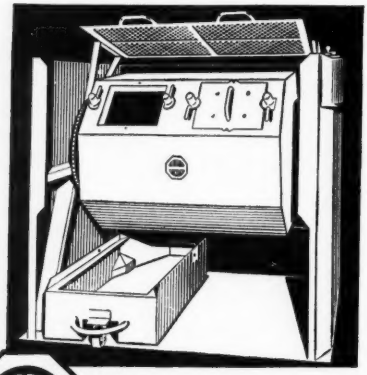

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kept within the prescribed limits in order that the deposit be sufficiently bright and smooth. Under these conditions, it has been found that the sodium carbonate content will not increase excessively. In any case, the sodium carbonate content should be maintained at less than 15 ounces per gallon.

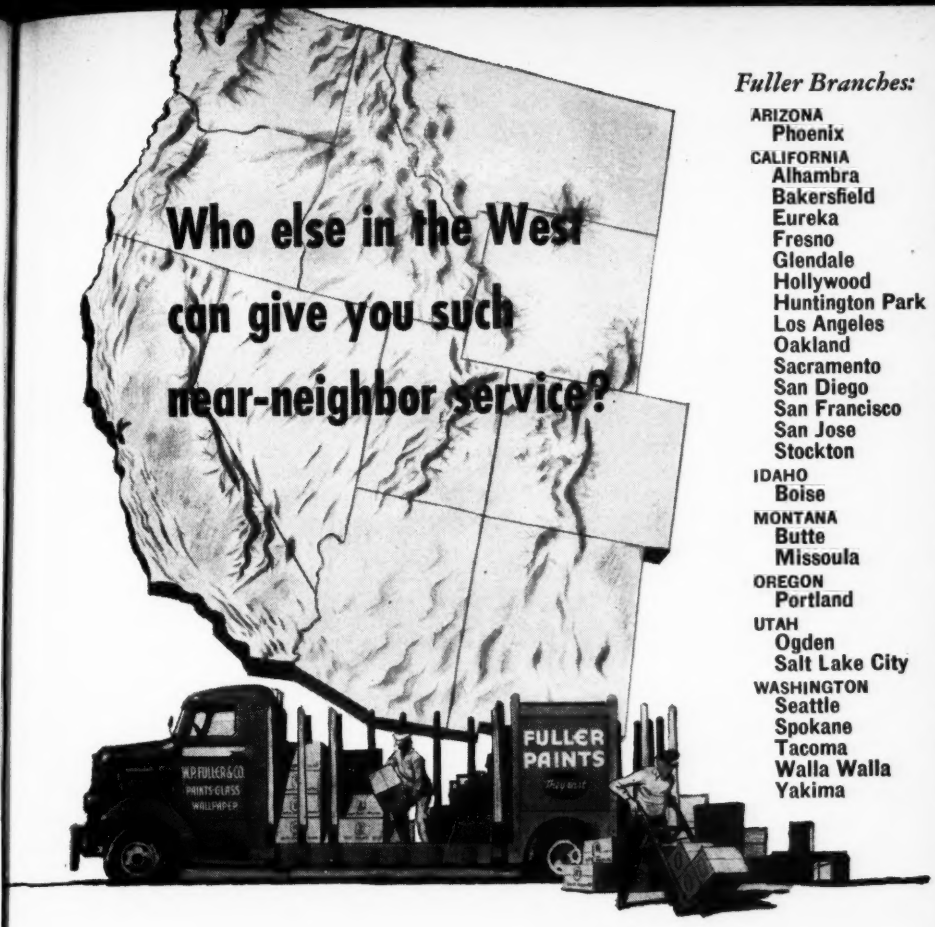
The current density usually employed in the "strike" bath is between 20 and 30 amp. sq. ft. The time of plating in the "strike" bath may run from 5 to 10 minutes. It was recommended by Nixon that not more than 0.0002 inch of copper be deposited from this bath if bright deposits are to be produced over it without buffing. On completion of the copper "strike" operation, the desired thickness of deposit in copper or nickel or both may be applied as on any other base metal. In order to reduce cost, according to Nixon, there is an increasing tendency to use bright copper deposits and bright nickel deposits followed by chromium plate without buffing either the copper or the nickel.

* * *

New Type Metal Primer Offers Improved Corrosion Resistance

ACCORDING to recent reports from the laboratories of the Bakelite Corporation, a unique "wash primer," which is still classed in the experimental stage, yields metal-primer bonds of unusual strength and durability. The product was developed as a result of a wartime research project carried out at the Bakelite laboratories for the Navy and until only recently was held under secrecy orders (see also "Chemical Industries," December 1946).

In composition, this unique "wash primer" is reported to be quite simple, consisting essentially of an alcohol solution of polyvinyl-butyral resin in which 30-50 per cent by weight of phosphoric acid (based on resin con-



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	Solution:		
		Analysis	Make up 1000 gal.
Copper Cyanide GM 1851-M	Copper Cyanide	2.5 oz./gal.	160#
	Sodium Cyanide	—	190#
	Free Cyanide	1 oz./gal.	—
Sod. Hydroxide GM 1806-M	Sod. Hydroxide	1 oz./gal.	65#
	Rochelle Salts	6 oz./gal.	375#
	Sod. Carbonate	2 oz./gal.	125#
	The solution should be analyzed weekly for all the above constituents, except Rochelle Salts, and appropriate additions made. Supplementing this, free cyanide should be analyzed each shift and additions made. Copper cyanide is added by withdrawing solution from the plating tank, making a slurry with the copper cyanide and returned to the plating solution.		

Fig. 6 — Composition of General Motors' specification copper "strike" used for zinc base die castings (*Illustration courtesy Fisher Body — Ternstedt Div., General Motors Corp.*)

tent) is incorporated. It is reported to be easily and rapidly applied at ordinary temperatures, using brush or spray methods, and dries to a hard coating in a matter of minutes. The new type primer appears to utilize both the physical properties of polyvinyl-butyral and the chemical characteristic of phosphoric acid. The resin itself is tough and adherent, and the phosphoric acid reacts with the steel surface to form a thin, rust-inhibiting film of iron phosphates.

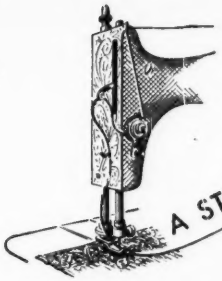
Most men in the finishing industry are familiar with the use of phosphoric acid, as such, for the preparation of metal surfaces prior to painting or application of primer coats. Phosphoric acid washes have been used in the field to some extent for washing steel prior to painting; hot phosphate type treatments, represented by several proprietary processes, have also been found valuable for treating metal surfaces prior to painting or organic finishing. The use of the resin-phosphoric composition is claimed to produce a uniform finely crystalline phosphate skin, which adheres well to ordinary steel, stainless steel, aluminum, or galvanized metal. The primer coating is reported to virtually eliminate corrosion creeping, which may result from a slight break in the paint film, thus allowing rust to creep under the paint and cause extensive scaling.

Athough the new resin-phosphate composition is reported to have anti-corrosion properties, it is not designed to be a complete primer. It is intended for use as a foundation for standard primers, such as red lead and linseed oil, alkyd or oleoresinous compositions which are applied in the usual thicknesses over the new primer compound. The greatest field for application of the new resin-phosphoric "wash primer" appears to be in the treatment of tankers, pipe lines, trains, and all structural steel parts prior to finishing by approved painting methods. The finishing engineer concerned with outside metal structures will want to keep informed on future developments with this new type primer coating.

* * *

Frosted Finish for Aluminum

THE finishing engineer looking for a change in a finish for aluminum articles may be interested in consider-



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ing the relatively low cost frosted finish, which has an attractive silvery appearance like that of finely etched glass. This finish may be found to be particularly useful for finishing small or intricately shaped articles not adapted to machine methods. Oftentimes, the frosted finish needs further protection such as can be provided by the usual anodizing processes. In some instances, clear lacquer may provide the needed extra protection from fingerprints, and so on. The frosted finish is used together with an anodization process (patented Alumilite process of the Aluminum Company) as a finish on refrigerator trays and is likewise applicable to many other products.

The first step in the frosting of aluminum is to etch in a hot caustic soda solution. According to recommendations of the Aluminum Company of America, this operation may be carried out under a wide range of conditions, depending on the gauge of the metal and the finish required. Immersion of the work for 1 minute in a 15 per cent sodium hydroxide solution at 160 to 180 deg. F. is frequently employed, although the concentration may vary from 2 to 25 per cent, and the bath may be heated to boiling. The etching process is greatly accelerated at the boiling temperature but the caustic may dry in streaks causing stains. To overcome this difficulty, some finishers of aluminum articles use a 5 per cent caustic solution, followed immediately by immersion of the work in a 2 per cent solution. The second solution is too weak to attack the surface of the aluminum in a short time, and therefore eliminates to some degree the problem of staining.

After the caustic treatment, the aluminum is rinsed in clear, cold water. If the time between these two steps is kept at a minimum, the danger of staining is minimized. Cold water is preferable to hot water be-

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cause it lessens discoloration.

The third step in the frosted finish process is to immerse the aluminum in strong nitric acid to neutralize any sodium hydroxide left on the surface. A satisfactory solution is made by mixing 2 parts of concentrated nitric acid with 1 part of water. However, concentrations as low as 10 per cent are sometimes used. This part of the treatment removes the colored film left on the surface by the caustic solution and leaves the metal with a clean, frosted finish.

When aluminum alloys which contain substantial amounts of silicon are to be frosted, it is necessary to add concentrated hydrofluoric acid to the nitric acid. One part of concentrated hydrofloric acid to 8 parts of concentrated nitric acid is a good proportion to use in commercial practice. The hydrofluoric-nitric mixture should be used cold.

Following the acid treatment, the aluminum article is rinsed in clear, cold water and then dried on a steam table. Due caution should be practiced in drying to prevent water marks. In some cases, air is used in drying.

* * *

Discoloration of Cadmium Plate

ONE troublesome phenomenon of warm, humid weather which most finishing engineers have encountered at one time or another is the discoloration of cadmium plate. This discoloration consists of an iridescent film which changes at first from golden yellow to brown, then to a purplish blue, and finally in some instances to black. While the mechanism of the discoloration process is not entirely clear, it is generally believed to be due to the decomposition of cyanide or from residual ammonium salts on the surface of the plate. Storing without proper air circulation, particularly in warm and humid weather, is a contributing factor. The staining is purely a surface condition and is not correlated with plating solution composition, operating conditions, or thickness of plate.

It appears that plate which has not been bright dipped, as well as nitric acid bright dipped plate, is prone to discoloration under the same conditions. From the chemical standpoint, ammonium salts can form from traces of cyanide on the work or by reduction of nitrate from the reaction between nitric acid and metal. One cure for the discoloration is to remove the chemicals contributing to the corrosion; a precaution that can be taken to prevent the appearance of discoloration is the selection of storage conditions that allow for free circulation of air.

Neutralization of the salts causing discoloration can be accomplished by relatively strong oxidizing agents which in themselves do not discolor cadmium. Such solutions as weak al-

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kaline permanganate, perborate, or chromic acid may be used. Solutions of chromic acid and sulfuric acid (patented) in addition to being effective as bright dips also remove the stain-inducing chemicals. In using the above process, it is reported that weight ratios of chromic acid to sulfate must be kept above 20 to eliminate yellow film formation. This yellow film and also a film which is attributed to excessive trivalent chromium if not removed may also result in the cadmium plate turning a bluish-black color. While this film can be removed by dipping the work in a 1 per cent sulfuric acid solution, cadmium plated surfaces so treated do not have the degree of tarnish resistance of simple chromic acid dipped articles.

Zinc plate does not discolor under the same conditions as observed for cadmium; however, zinc surfaces are more sensitive to moisture, sometimes giving a hazy white surface when exposed to damp conditions for an extended period of time. A number of chemical treatment processes have been developed to retard this type of corrosion on zinc plated articles. In general, the electroplater will find that both bright zinc and cadmium surfaces will remain relatively bright and clean for long periods of time in a dry non-corrosive atmosphere.

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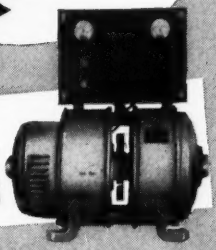

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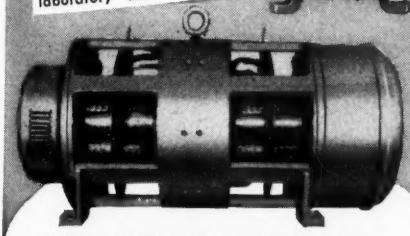

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2. Non-corrosive brass brush-holders.
3. Non-corrosive brush-holder springs – phosphor bronze.
4. Compact.
5. Comes completely wired.
6. Terminals to which both motor and generator connections are readily accessible and simple to operate.
7. Requires no prepared foundation. All self-contained. Easy to install.

MOTOR GENERATOR CORP., Box PF-67
Troy, Ohio *(Affiliate of Hobart Brothers Co.)*

MGC
One of the world's largest builders of Electric Generators.

Motor Generator Corp., Box PF-67, Troy, Ohio
Send me without obligation information on items checked.
☐ Model 127 ☐ Model 132 ☐ Buffer-Grinder

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FIRM_____
ADDRESS_____

PRACTICAL APPLICATIONS *of Modern Products*

Periodic Reverse-Current Plating Process Produces Better Finish

AN electroplating process in which finishing costs are said to be reduced 20 per cent or more while the resulting product is provided with a finish fully equal to that produced by older methods was described by George W. Jernstedt, manager of electroplating projects for the Westinghouse Electric Corporation, at a meeting of the American Electroplaters' Society in Pittsburgh.

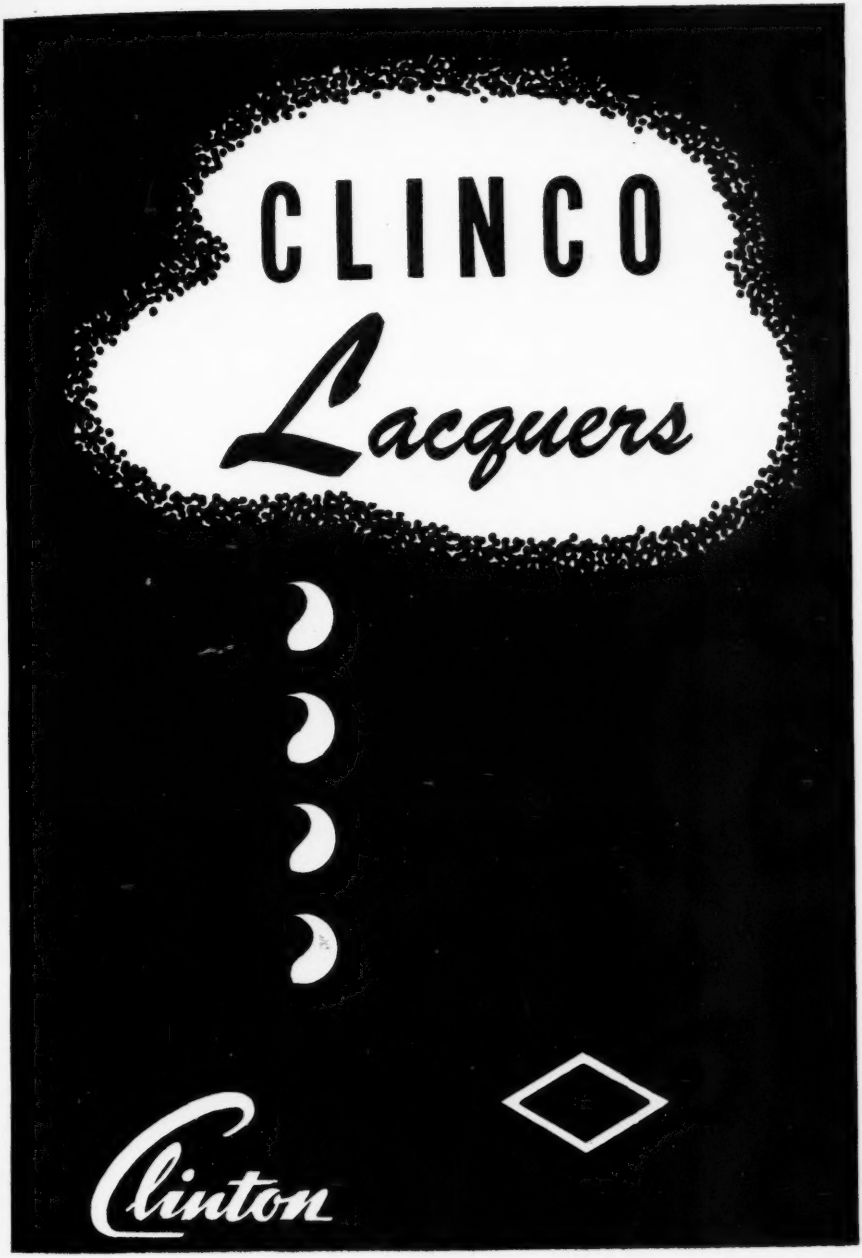
With the plating process, current is reversed periodically to remove surplus or unsound metal, level peaks, and polish. Loose or surplus plate is "wiped" off by these electrical backstrokes, leaving only the smooth, tightly fastened atoms. Successive layers of plate can be built up by this method to almost any desired thickness to produce a deposit of unusual density and of maximum homogeneity.

Using the Periodic Reverse-Current method, it is possible to produce a plate that is considerably smoother than the surface of the material to which it is applied. Burned electrodeposits, nodules, exaggerated build-up or metal at corners or at sharp points can be reduced or eliminated when the process is used, it is claimed.

Maximum speed is obtained with the Periodic Reverse-Current method of plating, mainly because strong current can be used in the plating portion of the cycle. Since the metal surface is brightened by the current reversal, hand burring or polishing can be reduced or eliminated in many cases.

The process is said to work better with some electrolytes than with others. Plating baths best suited for its use are the cyanide-type baths such as copper, silver, zinc, cadmium, and even gold. It is pointed out that such factors as temperature, metal concentration, and alkalinity or acidity of the solution must be carefully studied to obtain best results for each adaptation.

These three meter magnets were electroplated by different methods in the same solution and none of them has been polished. All received approximately the same amount of copper plate. The magnet on the left was direct-current rack plated for 5 hours, the one in the middle was direct-current barrel plated for 7 hours, and the one on the right was Periodic Reverse - Current plated for 4 hours.


CLINCO
Lacquers
Clinton

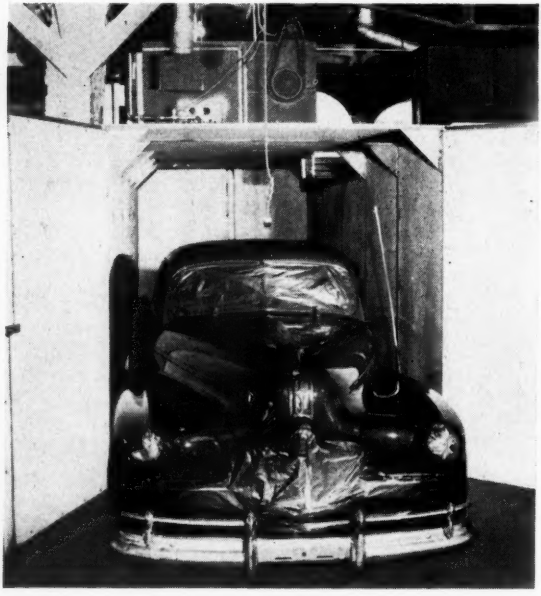
Low-Bake System Permits Automobiles to Be Repainted in Wide Variety of Colors

A HIGH speed automobile refinishing system which enables a car owner to have his car repainted in any one of 3,700 original factory finishes in less than five hours' time has been developed by the Sewall Paint and Varnish Division of the American-Marietta Company.

In Kansas City, the low-bake system operated by Modern Automotive Finishes, Inc., is used in completing as many as 15 cars in an eight-hour day. Factory finish color charts and specifications for matching with especially prepared Dural low-bake enamels make it possible for the operator to accurately reproduce any one of the 3,700 listed factory finishes. These low-bake enamels have special oxidizing characteristics which permit the finish to dry completely within 45 minutes. Temperatures in the bake oven ranging from 165 to 180 deg. cause a curing action in the enamel so that as soon as the car is removed from the oven and cooled, it is ready for immediate service.

Refinishing is done on an assembly-line basis, each of eight operations requiring at least 20 feet of floor space. First, metal work is repaired and sanded, the car is washed and cleaned of all dirt and grease, windows and chrome are masked, and the car is primed with a coat of special Sewall lacquer. The car is then ready for water sanding with the use of fine abrasive paper. An air-driven water sanding machine is used in this operation to permit the use of a large volume of water to wash the wastes away.

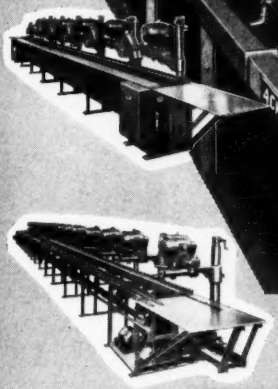
After the car has been carefully inspected to ensure that all masking tape is firmly in place and that all imperfections have been filled and sanded, the entire car is carefully blown off by a high pressure air hose to remove all traces of dust and moisture. It is then ready for the paint booth where two operators with high pressure spray guns, working at opposite sides of the car, apply the desired color. Ventilation in the booth is supplied by two blowers, each equipped with filters to keep the booth absolutely dust-free. Doors from the spray booth open directly into the oven where the car is baked at the 165 to 180-deg. temperature.

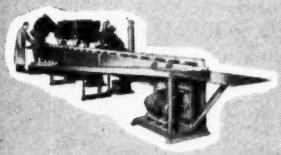


Repainted automobile emerging from low-bake refinishing system

A STRAIGHT LINE FOR BETTER FINISHING

Bumper sections running on a 12 head ACME (horizontal return type) AUTOMATIC STRAIGHT LINE polishing and buffing machine.





Horizontal return, over and under, and loose fixture with power return are straight line arrangements that can be furnished.

ACME AUTOMATIC STRAIGHT LINES have proven, in plant after plant, to be the short cut to increased production and finer finishing. Whatever the item, if it's adaptable to straight line finishing, you can depend on an ACME AUTOMATIC to speed up production in your polishing and buffing department. In addition, ACME builds all types of Semis and Rotary Automatic polishing and buffing machines.

Send samples and details for recommendations as to the most efficient automatic machine operation.

SEE OUR DISPLAY—BOOTH 40 INDUSTRIAL EXPOSITION—DETROIT—JUNE 23-27, 1947

SPECIAL MACHINERY AMC AUTOMATIC BUFFING MACHINES

ACME Manufacturing Co.

1645 HOWARD ST. DETROIT 16, MICH.

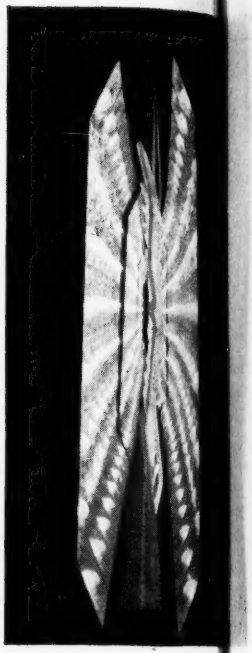
Builders OF AUTOMATIC POLISHING AND BUFFING MACHINES FOR OVER 35 YEARS

Infra-red oven for degreasing metal chair frames

Infra-Red Degreases Chair Frames in 2½ Minutes

AT the Barcalo Manufacturing Co., Buffalo, N. Y., an "Evenray" installation made by The Fostoria Pressed Steel Corp., Fostoria, Ohio, is being used to degrease metal chair frames on a production basis. The illustration at the left shows the infra-red "degrease" oven which is used to degrease the chair frames in the short time of 2½ minutes. The intense heat from the infra-red lamps converts the grease to carbon which goes up in smoke.

The entire finishing operation on the chair frames is automatically performed at the Barcalo plant; the frames are not touched from the time they are placed on the conveyor until removal for further assembly operations. After degreasing, the frames continue to travel on the conveyer for a "cool-down" period and are then coated with white enamel by electrostatic spraying. Following this, the frames enter another Evenray oven 51 feet long, shown at the right, which bakes the finish in 8½ minutes.



Infra-red oven for finish baking metal chair frames

Plastic Replica Affords Method of Evaluating Surface Roughness

EVALUATION of surface finish or roughness, essential in specifications for mechanically finished surfaces, is obtained by a new National Bureau of Standards method in which a carefully prepared plastic replica of the surface is analyzed by photoelectric means. The replica surface analyzer, developed by Harry K. Herschman of the Metallurgy Division, is based on the use of a plastic replica of a surface, which reproduces in minute detail the protuberances and recesses of the surface, as shown in Fig. 1. The plastic replica is produced by applying a suitable solvent, or solution of plastic in solvent, to the test surface and pressing on a strip of clear plastic film. When dry, the film, or replica, can be readily stripped from the test surface.

The evaluation of a surface consists essentially in passing a restricted beam of light through an oscillating replica and then through a suitable restricting diaphram onto a photoelectric cell. The replica is oscillated with respect to the light beam in a straight line or in a curved path, with the path of motion maintained so that the light beam will cross the protuberances and recesses of the surface.

Even very minute variations in the number and nature of the protuber-

Sure Cure for Finishing Room Headaches...

M&W's

HAMMERTONE

packs your product with the proved sales-appeal of a hammered-metal-like finish... reduces rejects... helps finishers stay out of trouble because it's so simple to use.

If you're looking for a finish that's easy to apply, yet gives your product that "look" that appeals to buyers — Hammertone is your answer.

Available in practically all colors, Hammertone can be sprayed on either metals, wood or plastics with equal success. It bakes or air dries to a tough, smooth finish with the striking appearance of hammered metal. Weld marks and small surface defects are hidden by Hammertone, which — in addition to its uniform results in application — reduces rejects to a minimum.

For further information, write for Technical Bulletin #115 or ask your M&W representative. Color card is available.

PIONEERS IN PROTECTION
M&W Co. 1876

... where industry goes with finishing problems

MAAS & WALDSTEIN COMPANY NEWARK 4, NEW JERSEY

1658 Carroll Avenue, Chicago 12 • 6 Jersey Street, Boston 15 • 10751 Venice Blvd., Los Angeles 34

PRODUCERS OF LACQUERS, ENAMELS, SYNTHETICS AND SPECIALIZED PRODUCTION FINISHES

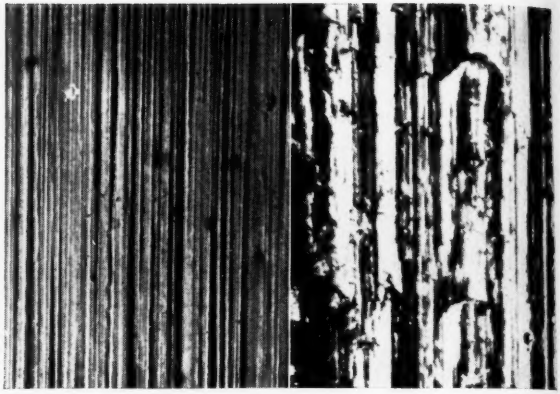


Fig. 1—Micrographs of surfaces obtained by the use of plastic replicas employed in the replica method of evaluating surface roughness developed at the National Bureau of Standards. Replicas of a finely ground surface (left) and a coarse-shaped surface (right) were photographed with transmitted light at a magnification of 100.

ances and recesses on the replica film cause corresponding variations in the intensity and angle of refraction of the light transmitted by the replica. The light passing through the restricting diaphram strikes the photoelectric cell and produces a correspondingly varying current. The average voltage variation, measured by a suitable alternating current electronic voltmeter, is proportional to the variation—from increment to increment on the replica—of the amount of light allowed by the geometric form of each increment to reach the photoelectric cell. Meter readings or records are translated into "roughness" evaluations by calibrating against surfaces of known roughness as determined by microscopic means.

The salient features of the replica method for surface analysis are: (1) maintenance of a permanent record of a surface finish, (2) rapid evaluation of a relatively large area of surface in one determination, (3) simplicity of operation, (4) prevention of damage to surface, even for soft materials such as lead or tin-base alloys, and (5) availability of the method, since the replica may be prepared in one locality and transported to the location of the analyzer. There are indications that this method may also be applicable for evaluating the corrosion pitting of metals. A diagrammatic sketch showing the principal features of the replica surface analyzer is shown in Fig. 2.

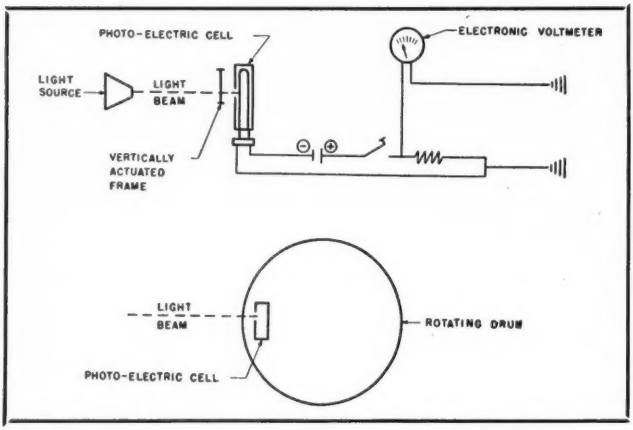
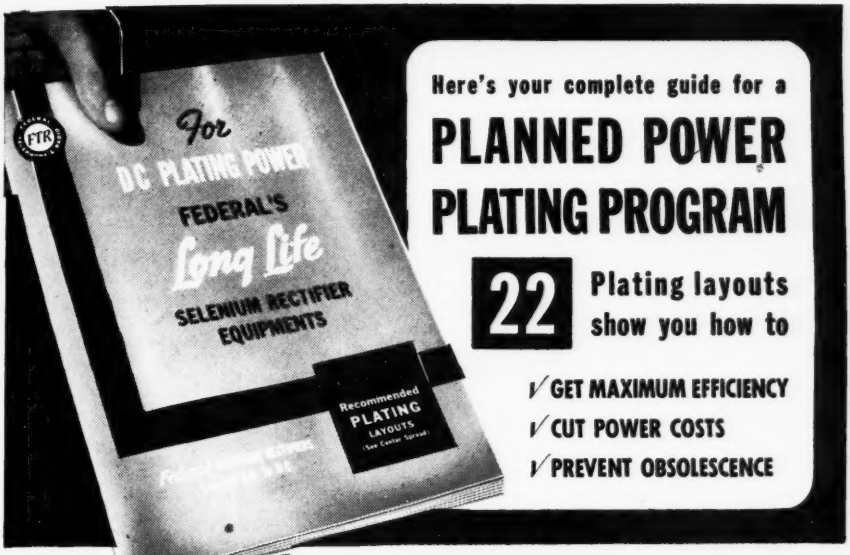


Fig. 2—Diagrammatic sketch showing the principal features of the replica surface analyzer



Here's your complete guide for a

PLANNED POWER PLATING PROGRAM

22 Plating layouts show you how to

- ✓ GET MAXIMUM EFFICIENCY
- ✓ CUT POWER COSTS
- ✓ PREVENT OBSOLESCENCE

with Federal's Selenium Rectifier Equipments

SEND FOR YOUR COPY TODAY!
This 24-page booklet is yours for the asking. Write to Federal, requesting Electroplating Data Book E934.

WHETHER YOU'RE PLANNING a complete electroplating installation, modernization of existing equipment, or the expansion of your facilities, this new booklet points the way to increased profits — lower operating expense.

Profusely illustrated, with charts, diagrams and data tabulations, it shows you how to plan your D-C power supply to meet both present and future needs — with scientifically engineered *flexible* layouts featuring Federal's *long-life* Selenium Rectifier Equipments.

Planned power means maximum efficiency, power savings, flexibility. Federal equipment, with the famous "Center Contact" Selenium Rectifier, means maximum service life, minimum maintenance, year-after-year dependability — backed by America's oldest and largest producer of Selenium Rectifiers.

Federal Telephone and Radio Corporation

In Canada: — Federal Electric Manufacturing Company, Ltd., Montreal.
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100 Kingsland Road,
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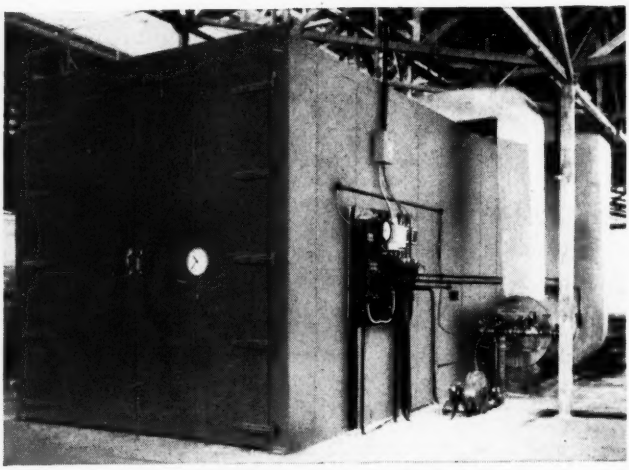


In the 40-foot chamber of this batch type oven, installed in Monterrey, Mexico, a fully assembled transport bus can be finish-baked.

Mexican Firm Uses Batch Type Oven to Bake Finishes on Bus Bodies

FULL-SIZED transport buses, completely assembled except for tires and gasoline tank, are now being finish-baked in a large Despatch oven recently installed in one of the plants operated by Industrias Metalicas S. A., Monterrey, Mexico. The oven, heated by a powerful forced convection heating system, is a rectangular batch-type unit with a chamber 40 feet long x 13 feet wide x 13 feet high.

To save time and reduce handling, the Mexican firm has adopted a procedure whereby a bus body is loaded on two supported dollies, the prime coat applied, and the entire unit then pulled into the roomy oven chamber. After baking at 350 deg. F. for one hour, doors in the opposite end of the chamber are opened and the load removed. This procedure allows for straight-line handling of bus bodies through the oven and simplifies loading. The final (finish) coat is baked at a slightly lower temperature of 300 deg. F. for 30 minutes.

An overhead monorail is suspended from the top of the Despatch oven chamber to simplify handling when finishing other Industrias Metalicas products, such as steel office furniture, chairs, and filing cabinets. The heat source is a 1,000,000 B.T.U. natural-gas-fired Despatch heater mounted on the floor outside of the oven chamber. The heater is interconnected to a high-volume fan and specially sized heat distributing ducts equipped with adjustable ports to allow for control of heat flow. The heat ducts extend along the side walls of the oven while the recirculating ducts are located in the ceiling of the furnace.

"Treatment of Ferrous Metals Before Painting." A special phosphate-type conditioning treatment for removing light soils and preparing ferrous metal surfaces for painting is the subject of a four-page service report issued by Oakite Products, Inc., 20 Thames St., New York 6, N. Y. The report fully describes the phosphatizing treatment as supplied by Oakite Compound No. 36, a mildly acidic material having the ability to remove light oils, grease, shop dirt, and light rust while at the same time imparting a phosphate-coating on metal surfaces to assure improved paint adhesion and resistance to corrosion. Copy of the report, which provides full particulars, suggested methods of application, recommended concentrations, and so on, is available free upon request.

The New Miracle Finish

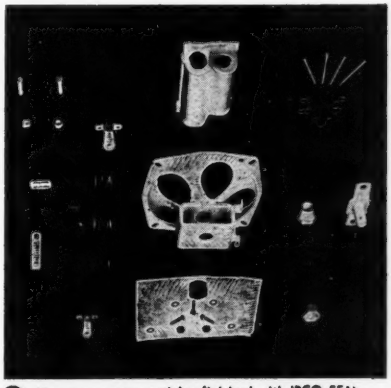
IRCO - Seal

- **The IRCO-IZING PROCESS plus IRCO-SEAL is a complete metal preparation and finish in one operation.**

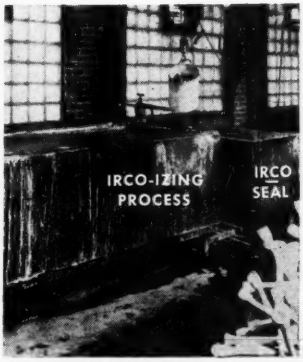
IT SAVES COST AND LABOR • EASILY SET-UP • SIMPLE TO MAINTAIN • IRCO-SEAL CAN BE DIPPED OR SPRAYED.

After the metal emerges from the IRCO-IZING bath, *it need not be dried* before application of IRCO-SEAL.

IRCO-SEAL is a satin-like organic finish, durable, *will not clog threads*, and dries rapidly.



- **Above are some articles finished with IRCO-SEAL (Note the smooth finish and unclogged threads) 300 HOUR SALT SPRAY RESISTANCE**



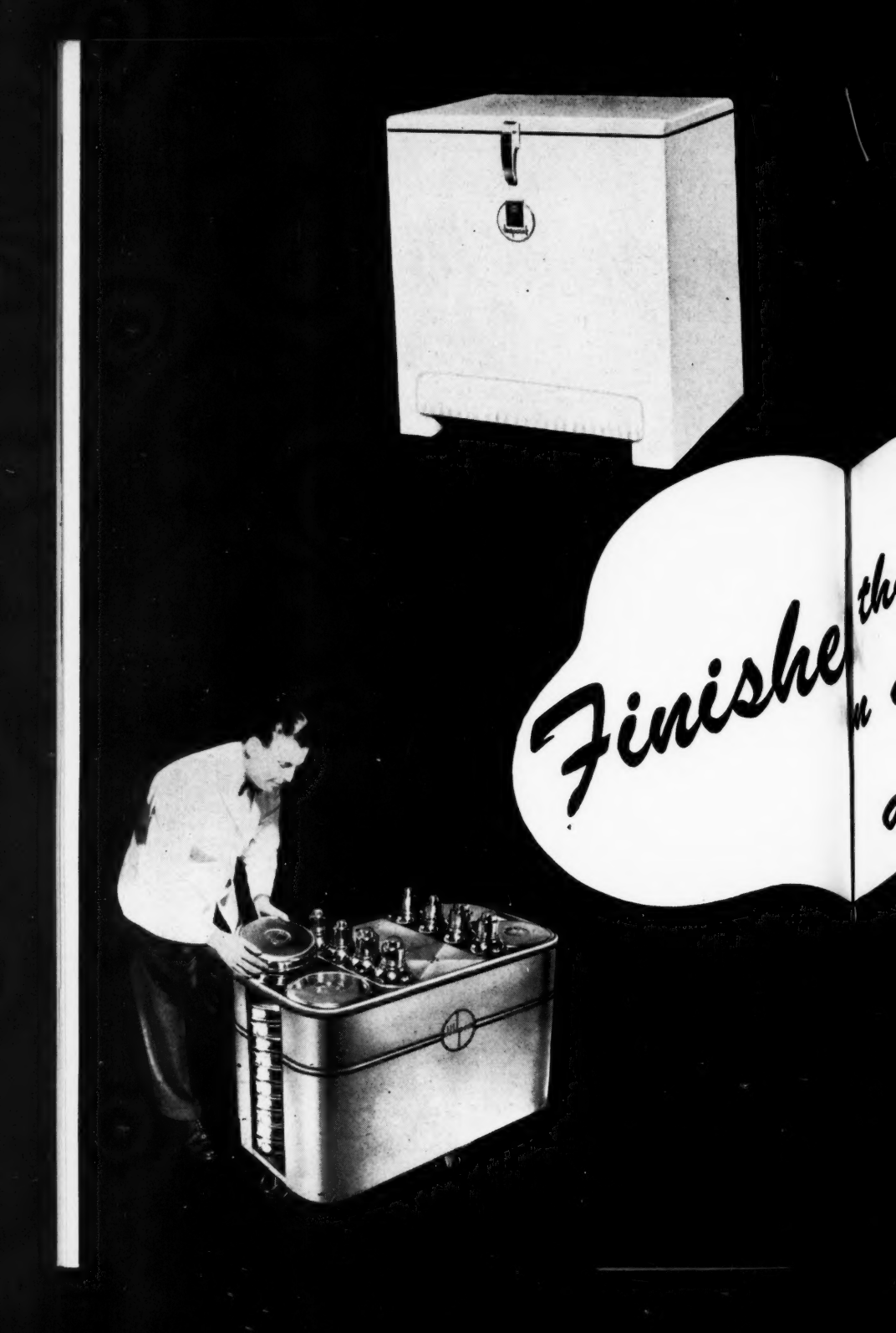
The IRCO-IZING PROCESS is a hot zinc phosphate treatment for iron, steel, zinc and cadmium, providing a rust inhibiting phosphate base for all finishes.

IRCO-SEAL is immediately available in the following colors:

- **Bright metallic (Replaces Plating)**
- **Brown**
- **Mahogany**
- **Blue**
- **Black**

INTERNATIONAL RUSTPROOF CORPORATION

CLEVELAND OHIO


Finishe

e that aid
n appearances
and utility

NEWS of the Industry

New Managers of Fuller Laboratories

New managers of the South San Francisco and Los Angeles laboratories of W. P. Fuller & Company, large western paint manufacturer, have been appointed by W. P. F. Brawner, director of production. A. P. Paul has been appointed manager of the company's South San Francisco laboratories. Formerly manager of the Los Angeles laboratory, Mr. Paul has been with the company since 1930.

Leonard Beltrami succeeds Mr. Pahl as manager of the Los Angeles laboratory. He has been with the company since 1927 and has been on the Los Angeles laboratory staff for the past 10 years. Walter D. Jones will continue as technical director and will act in an advisory capacity. Mr. Jones, who has directed the Fuller laboratories for many years, has been with the firm since 1907.

Moves to New Plant

The Buckingham Products Company, manufacturer of polishing and buffing compositions, has moved to its new plant at 14100 Fullerton Ave., Detroit. The new plant includes twice the producing area of the old plant, with space provided for anticipated production increases.

Organized 12 years ago by R. M. Buckingham, president, who has had 27 years of experience in the development and manufacture of metal-finishing compounds, the firm has over 35 representatives in active industrial areas from coast to coast.

Charles W. Yerger Resigns

The Lea Manufacturing Co., Waterbury, Conn., announces the resignation of Charles W. Yerger as chairman of the board, with complete severance of all connections with the company.

Optimus Field Service Representative

The Optimus Detergents Co., 140 Main St., Matawan, N. J., manufacturer of industrial cleaning materials, announces the appointment of M. Paul Conant as field service representative. He will cover Hudson, Bergen, Passaic, and Morris Counties in New Jersey.

Mr. Conant has had wide experience in the field of industrial cleaning, having formerly represented Turco Products, Inc. More recently, he was with Bendix, Incorporated.

New plant of Buckingham Products Company

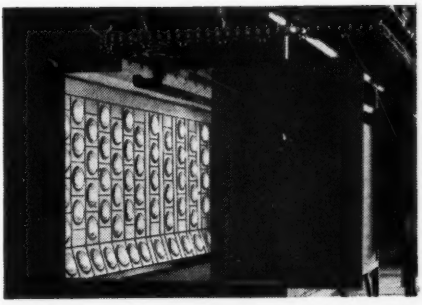
2 Ways JENSEN "Dual heat" Infra-Red Ovens

PAY OFF

IN EXTRA SAVINGS
ON FINISHING COSTS

1 "NESTED" LAMPS

Far greater heat densities in far less time! Assured *even* distribution of heat! Elimination of danger of overbaking certain areas while underbaking others! End of costly waste on the finish line! These are a few of the benefits of the exclusive Jensen Method of "nesting" lamps . . . whereby each lamp actually OVERLAPS the lamps above and below it.



2 "FLEXIBLE SPACING" OF LAMPS

At last! You can bring heat up to desired temperatures *immediately* and "hold" temperatures *without wasting power!* Jensen "flexible spacing" . . . with unlimited heat variance combinations . . . makes this possible. Lamps can be concentrated on close centers at the beginning of the oven and spread farther apart in rest of oven. You cut power costs. You use fewer lamps.

WRITE FOR DETAILS TODAY!

JENSEN SPECIALTIES, Inc. JENSEN 9331 FREELAND DETROIT 27, MICH.

DESIGNERS and BUILDERS of "DUAL HEAT" INFRA-RED OVENS • CONVEYORS • PAINT DIP TANKS

Ferro Expands Oxide Division

To help meet unprecedented demands for ceramic oxides, stains, and colors, the Ferro Enamel Corporation, Cleveland, is increasing its production facilities by 50 per cent. According to R. F. Duncan, manager of the Ceramic Color Division, this is the first of two steps in a general expansion program to increase the company's output of colors.

Ferro's Oxide Division is now producing a complete range of color oxides for porcelain enamels and glass stains, body stains, overglaze and underglaze colors for the pottery and china industries.

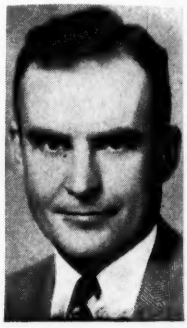
United Chromium Sales and Technical Staff Additions

To further increase its service to users of Unichrome materials and plating processes, United Chromium, Inc., announces the appointment of three highly qualified men to its technical and sales staff. David E. Hartman will act as investigator and provide technical consultations on specialized applications of Unichrome products. His experience includes business associations with the Harco Products Corporation and the Metal and Thermit Corporation.

Expanding the Los Angeles branch of United Chromium are Don F. Edwards and James Martin. Mr. Edwards, with a degree in chemistry, served with the L. M. Schwien Engineering Company as an electroplating chemist and with the Goodyear Synthetic Rubber Corporation as a development chemist. Mr. Martin, with over three years of service in the Navy, has recently received his degree in chemical engineering.

Appointed Chicago District Manager of EP

Gordon J. Berry, vice president and sales manager of The Electric Products Company, announces the opening of a new district office in Chicago at 915 Old Colony Building, 407 S. Dearborn Street. Robert R. Kovach has been appointed Chicago district manager and is responsible for handling all sales and service negotiations in the territory.



Robert R. Kovach

Mr. Kovach graduated from the University of Kansas in 1939 with a B.S. degree in mechanical engineering. After six years of sales and engineering experience, as well as a year of management consulting, he joined The Electric Products Company in July 1946.

Burns Appointed District Representative

The E. Reed Burns Manufacturing Corporation announces the appointment of the A. B. Plating Supply Co., 1421 N. Water St., Milwaukee 2, Wis., as its district representative covering the State of Wisconsin and the northern part of the state of Illinois.

A. F. C. Johnson of the above company will represent the Burns Company in the distribution of its products, which consist of polishing compounds, buffs, and polishing wheels. Mr. Johnson is well known in the territory, being a member of the executive committee of the Milwaukee Branch of the American Electroplaters' Society.

(Left to Right) David E. Hartman, Don F. Edwards, and James Martin

SOFT

as a Velvet Glove

STRONG

as an Iron Hand

CLAREMONT *Flocks**

***RAYON • COTTON • WOOL**

Various Length Fibres
Uniform • Fluffy • Filling

Brilliant Colors, Pastels and Neutral Shades

Decorative Simulations: Suede, velvet, leathers, embroideries, exclusive fabrics . . . Ingenuity alone limits the range of sales-stirring effects.

Industrial Uses Include: Insulations, Surface coatings, Protective finishes, etc.

A Claremont flocked surface has the appearance and feel of a rich custom finish . . . soft as a velvet glove . . . radiating charm and sales appeal. Yet this expressively exquisite application is durable and tough . . . a rugged, seamless surface that wears like iron.

Claremont flock, the finish with a thousand uses, can be quickly and economically applied to almost any surface or shape . . . glass, wood, metal, paper, cloth, leather, etc. Provides a soft-textured, protective, non-marring surface.

Check the advantages of Claremont flock against your finishing requirements, then write for samples and prices. Full details on application techniques and uses will be sent promptly upon request. Inquiries invited!

CLAREMONT WASTE MFG. CO.
The Country's Largest Manufacturer of Flock
CLAREMONT, NEW HAMPSHIRE

(Left to Right) A. E. Grapp, G. M. Lund, C. P. Doherty, G. L. Schuster, and Fred Larson

Despatch to Continue Present Policy

The policy and program of the Despatch Oven Co., Minneapolis, Minn., will follow the course set by its late president, H. L. Grapp, according to A. E. Grapp, chairman of the board and father of the deceased head of the company. Key men who worked closely with the late president for many years have been selected for executive posts in the company.

Founding the company in 1902, A. E. Grapp has always been active in its direction and plans to continue as an active board chairman. The new president of the company is George M. Lund who is well qualified to take over the responsibilities of his office after many years as Despatch's comptroller, vice president, and assistant to the late president. Mr. Lund has the support of C. P. Doherty, executive vice president and general manager, whose appointment to this new post is preceded by 28 years of experience with the company.

Other officers and directors appointed include G. L. Schuster, new vice president-treasurer and chief engineer; Fred Larson, vice president-secretary and chief electrical engineer; Mrs. Ida S. Grapp, director; and John W. Watson, vice president, who is in charge of the Despatch branch in Chicago.

Allied Research Products Inc.

According to a recent announcement, the operating management of Rheem Research Products Inc.—Iridite Division has purchased this division from the Rheem Manufacturing Company and will operate it under the name of Allied Research Products Inc. The exclusive right to manufacture and sell Iridite in the United States and foreign countries has likewise been arranged on a royalty basis with the Rheem Manufacturing Company.

In addition to the manufacturing and selling of Iridite, operations will include the manufacturing and merchandising of a line of jewelry enameled copper giftware known as "Ceramicraft." Also, a metal-finishing job shop will be operated for the electroplating of zinc and cadmium, vitreous enameling, and painting.

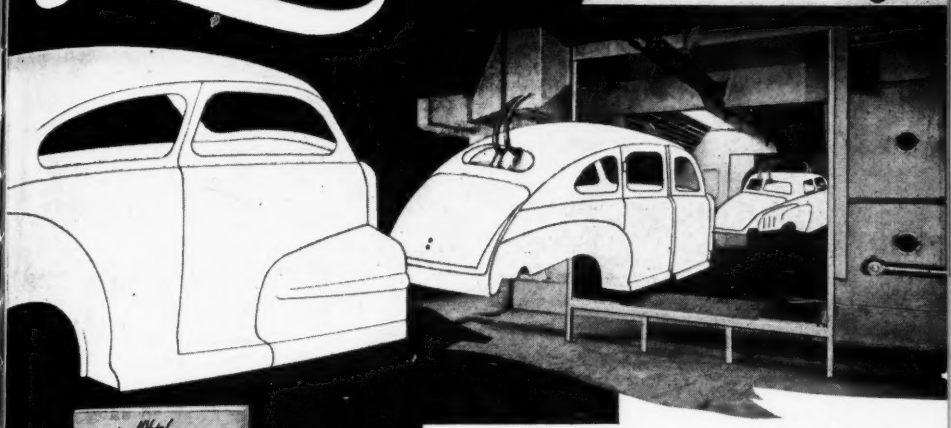
SVW Awards Gold Watches

At a recent meeting of the employees of the Staten Island and Linden, New Jersey Divisions of the Standard Varnish Works, J. Heath Wood, president, presented gold watches to 32 employees who had been with the company 25 years or longer. A similar presentation had been made to the employees of the Chicago Division.

Opens Branch

The Standard Plating Rack Company, Chicago, announces the opening of a branch at Fairlawn, N. J. This plant, under the direction of J. E. Herr and located at 22-02 Raphael Street, will serve the middle Atlantic and New England states in the manufacture of insulated plating racks for all types of metal finishing. An expansion of the company's facilities for making sample racks at the Chicago plant is also reported.

Low MAINTENANCE COST!



MAIL Today

3rd of a series

YES, you'll probably never see 3 distinct types of automobile bodies passing on the same finishing line . . . . but what we *are* saying is that over 90% of all domestic car finishes are produced in some Peters-Dalton equipment.

Our experience in the automotive field is ample proof that we are able to assure time-saving . . . . easier handling . . . . improved quality . . . . more output . . . . and lower maintenance costs for any product.

We invite you to consider our large engineering staff, ample production facilities, prompt installation service and experienced "know-how."

PETERS-DALTON, INC.
17900 Ryan Road, Detroit 12, Mich.

☐ Kindly mail copy of "Hydro-Whirl Dust Collectors"

☐ Kindly mail copy of "Hydro-Whirl Spray Booths"

Name_____

Position_____ Company_____

Address_____

PETERS-DALTON *Incorporated*

17908 RYAN ROAD • DETROIT 12, MICHIGAN

HYDRO-WHIRL DUST COLLECTORS AND SPRAY BOOTHS—INDUSTRIAL OVENS, WASHERS AND VENTILATING SYSTEMS

Drake Named Pennsalt Assistant Vice President

William P. Drake, manager of sales of the Special Chemicals Division of the Pennsylvania Salt Manufacturing Company, has been appointed assistant vice president. Mr. Drake will assist the vice president in planning for and executing policies of Pennsalt's expanding sales force and in organizing sales activities.

William P. Drake

Mr. Drake joined Pennsalt in 1934. After two years in the various Pennsalt plants, he became associated with the sales organization and immediately was assigned to the job of introducing the then new product Orthosil to the industrial trade. In 1939, Mr. Drake was made manager of sales of the Pennsalt Cleaners Division and in January 1943 became manager of sales of the newly organized Special Chemicals Division.

Elected Vice President

The Jones-Dabney Co., Louisville, Ky., manufacturer of lacquers, varnishes, enamels, and synthetic resins, announces the election of E. F. Musterman as vice president. Mr. Musterman will be in charge of all manufacturing of the Louisville, Detroit, and Newark plants.

The board of directors of Jones-Dabney has been expanded to seven and now includes: William C. Dabney, president; Elliot S. Phillips, director; L. K. Scott, technical director; E. L. Pangborn, treasurer; A. W. Bornhauser, vice president and general manager; E. F. Musterman, vice president in charge of manufacturing; and J. C. Wilcox, vice president, director of sales.

Other officers are: C. W. Slocum, vice president in charge of Eastern District; E. J. Probeck, vice president in charge of Resin and Grinding Liquids Division; W. S. Stark, vice president in charge of railroad sales; G. K. Graves, vice president, Automotive Division; and F. H. Volk, secretary.

To Expand Manufacturing Facilities

The Watson-Standard Company announces plans for addition to its manufacturing facilities in Pittsburgh with a new modern plant to be located at Neville Island. Production in the new plant will be devoted largely to plastic finishes, a recent addition to the Watson-Standard line of technical coatings.

Zapon Sales Administrator

K. R. Longnecker has been appointed sales administrator of the Zapon Division of Atlas Powder Company, where he will supervise sales work on Zapon's complete line of industrial product finishes.

Mr. Longnecker started with Zapon in 1929 as a chemist and later became a salesman, covering Chicago, New York, and other territories, and then returning to Stamford to work on sales correspondence and service. In 1945, he was placed in charge of the New England sales division of Zapon.

Nelson Named Director of Sales

The appointment of Morie Nelson as director of sales of the Gripmaster Division has been announced by the Nelson Chemicals Corp., 12345 Schaefer Highway, Detroit, Mich. In his new capacity, Mr. Nelson will supervise sales and sales promotion for Gripmaster polishing wheel cement.

Morie Nelson

Prior to joining the armed services in 1943, Mr. Nelson was in charge of sales promotion on heavy chemicals for the Michigan Bleach & Chemical Company, predecessor to Nelson Chemicals Corporation. Upon leaving the Army in late 1945, Mr. Nelson was made assistant director of sales on Gripmaster, which position he held up until the time of his present appointment.

Rotary Automatic — equipped with Siefen spray guns buffing aluminum pans.

Siefen Buffing Nu Spra Glu FOR MIRROR FINISH

LATEST INFORMATION—
An authoritative manual on spraying, buffing and polishing compounds—available now!

See our display — Industrial Finishing Exposition,— Detroit — Booth 255.

AND REMEMBER —

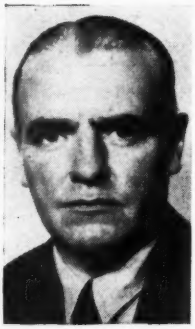
NU GLU is a ***liquid cold glue*** for setting up polishing wheels.

Buffing Nu Spra Glu, a grease and abrasive mixture, sprays to wheel, cuts compound consumption in half and buff wear one third. Available in emulsion or oil-base types.

For satin finish—Nu Spra Glu. A liquid cold glue and abrasive mixture that dries instantly when sprayed on a revolving wheel.

J. J. SIEFEN COMPANY

5633 LAUDERDALE • DETROIT 9, MICH.



Edward G. Mansfield

Optimus Field Service Representative Appointed

Edward G. Mansfield has been appointed field service representative of the Optimus Detergents Co., Matawan, N. J., manufacturer of industrial cleaning materials. Mr. Mansfield will cover New York City and Essex, Union, and Middlesex Counties in New Jersey.

Candee Named Director of Research and Development

The Lea Manufacturing Co., Waterbury, Conn., manufacturer of burring, polishing, and buffing compounds and developer of finishing methods, announces the appointment of Ellsworth T. Candee as director of research and development. Mr. Candee, formerly with the American Metal Hose Branch of the American Brass Company, assumed his duties with the Lea organization on May 15. At the annual meeting of the company in February, he was elected a director.

A graduate of Rensselaer Polytechnic Institute, Mr. Candee is widely known in the plating industry and has been continuously active in A.E.S. circles, serving as president of the national body in 1941-42 and currently as chairman of the Research Committee.

Carborundum Appointments

H. K. Clark, president, The Carborundum Co., Niagara Falls, N. Y., announces the appointment of Clarence E. Hawke as director of domestic sales; Edwin B. Forse as manager of The Carborundum Refractories Division at Perth Amboy; Boyd H. Johnson as manager of refractories sales at Perth Amboy; and Russell G. Albertson as division manager of the Canadian Carborundum Company, Ltd., Niagara Fall, Ontario. All appointments were effective as of May 1.

Superintendents Appointed

The appointment of Theodore C. Jensen as superintendent of paint and enamel manufacture and Frank H. Russell as superintendent of vehicle manufacture for the new Springdale, Pennsylvania paint plant has been announced by E. D. Griffin, vice president of the Pittsburgh Plate Glass Company. Mr. Jensen has been associated with Pittsburgh Plate's paint division for 13 years. Since 1940, he has been production foreman at the firm's Houston, Texas, plant. Prior to his assignment to the Houston position, he was employed for 6 years in the varnish manufacture department at the company's large Milwaukee, Wisconsin paint plant.

Mr. Russell has served in technical positions at the Milwaukee plant since his graduation from the University of Illinois in 1937. After 5 years of service as a research department chemist at the Wisconsin plant, Mr. Russell was promoted to a varnish and resin technician, a position which he held until his current appointment. He is a member of the American Chemical Society.

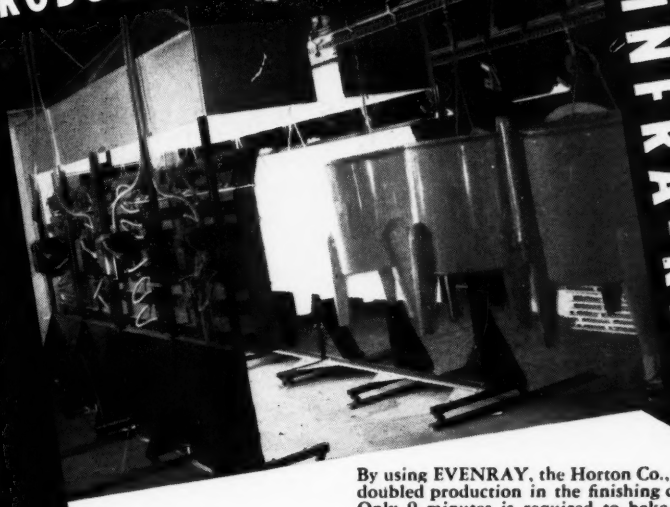
Michigan Chrome Appoints Eastern Sales Representative

George R. Houk has been appointed eastern sales representative for the Michigan Chrome and Chemical Co., Detroit, Michigan, and has established offices at 93 Ridge Rd., Hamden, Conn. Mr. Houk's activities cover the New England states, eastern New York and western Pennsylvania. He has been instrumental in broadening the list of distributorships in this area for the sale of many Miccro products used throughout the plating industry.

George R. Houk

Mr. Houk was graduated with honors in business administration from Wayne University in Detroit. He entered the Army in August 1941 and was discharged from the service with the rank of major in the aircraft ground forces.

PRODUCTION *Doubled* WITH INFRA-RED



By using EVENRAY, the Horton Co., Ft. Wayne, doubled production in the finishing department. Only 9 minutes is required to bake white synthetic enamel on washers, wringers and ironers. The product is sprayed on the conveyor—never touched again until ready to crate.

Only

FOSTORIA EVENRAY EQUIPMENT HAS ALL THESE ADVANTAGES —

1. **LOWER UNIT OPERATION COST**—Greater efficiency of gold reflectors requires lower connected load — provides maximum utilization of energy.
2. **MORE UNIFORM COVERAGE**—Evenray equipment design gives extraordinarily even distribution of energy on products being processed—as little as 2% variation.
3. **MAXIMUM TEMPERATURE RANGE**—Delivers up to 125 BTU's per square inch per hour. Accommodates from 80-watt to 1000-watt lamps for fastest processing according to job requirements.
4. **MAXIMUM ENERGY UTILIZATION**—Two-wall oven construction and gold interior reflecting surface provide most effective insulation. It puts the energy on the product.
5. **COMPLETE LINE OF EQUIPMENT**—Evenray models are available for spot heating or full ovens, utilizing clear or reflector type lamps; permitting a choice for best results depending on the nature of the product to be processed. Flexibility of construction permits quick and easy alteration or addition for production changes.
6. **APPROVED ELECTRICAL CONSTRUCTION**—Listed under Re-examination Service of Underwriters' Laboratories, Inc.

Write for Brochure Ev-1146 which pictures and describes many applications with Fostoria Evenray Systems.

THE FOSTORIA PRESSED STEEL CORP.
FOSTORIA, OHIO
Specialists in Infra-red Heating and Industrial Lighting Equipment
In Canada: Amalgamated Electric Corp. and all Northern Electric Branches

Representatives Appointed

To increase its field engineering services to customers in Northern Ohio, the Mixing Equipment Co., Rochester, N. Y., announces the appointment of new district representatives. The White Industrial Sales & Equipment Company, with offices in Akron and Cleveland, will now handle the Mixing Equipment Company's account in the entire State of Ohio.

In the Akron office, H. H. Baker, Jr., chemical engineer, graduate of the University of Louisville and formerly with the Firestone Tire and Rubber Company, will be the customer contact engineer, while O. H. Heinicke and H. H. Baker, Jr. will serve in the Cleveland area.

P.E.I. Forum Dates Announced

The Ninth Annual Forum of the Porcelain Enamel Institute will be held September 10, 11, and 12, 1947 at Ohio State University, Columbus, Ohio. Official headquarters will be the Deshler-Wallick Hotel, Columbus.

According to Edward Mackasek, P.E.I.'s managing director, the program of the Forum will cover a wide variety of subjects since certain shop management problems will be on the agenda along with technical and processing papers. The discussion program is being built largely around member-suggested topics, each of which will be handled by an industrial authority on the subject.

A large delegation from the British Institute of Vitreous Enamelers is planning to attend the Forum.

New Inco Appointment

Wayne Z. Friend has been appointed assistant section head of the Corrosion Engineering Section of the Development and Research Division of The International Nickel Co., Inc. Mr. Friend has been with the Development and Research Division in New York since 1937. After receiving the degrees of bachelor and master of science in chemical engineering at West Virginia University, he became associated with the Development and Research Department of the Baltimore Gas Engineering Corp., Charleston, W. Va. From 1929 to 1937, he was successively district manager and chief technologist of the Philgas Department of Phillips Petroleum Company.

PERMAG

Prepares the Surface

PERMAG Cleaning Compounds

—produce a chemically clean surface on metal prior to finishing.

This CLEANING PROCESS is vitally important. Proper adhesion depends on surface preparation. PERMAG cleans quickly—thoroughly and most economically. Metal fabricators are proving this in their plants. Glad to furnish you with facts about PERMAG. Write us.

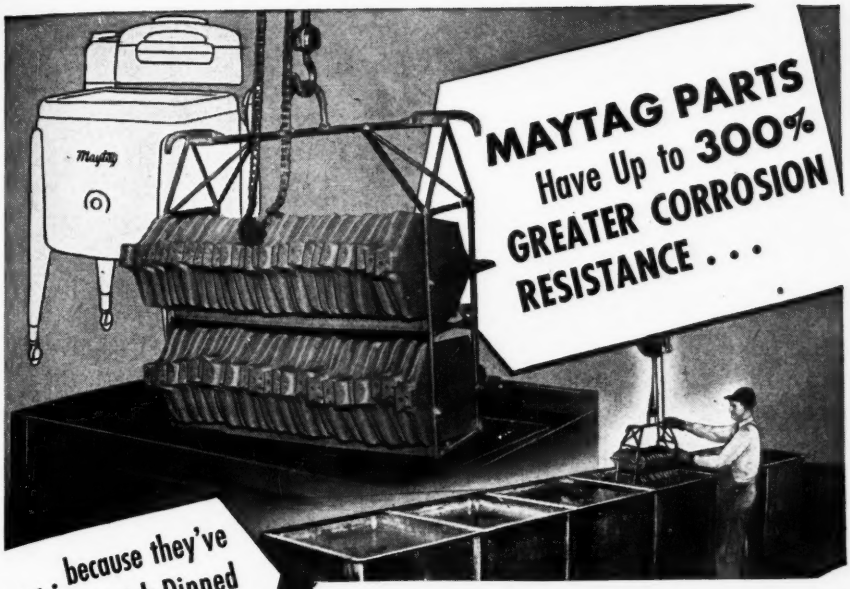
Our Technical department will be glad to help solve your hard cleaning problems. No obligation for interviews.

Magnuson Products Corporation

Mfrs. Specialized Cleaning Compounds for Industry

50 COURT STREET **BROOKLYN 2, N. Y.**

In Canada: Canadian PERMAG Products Ltd., Montreal, Toronto



Simple maintenance - - simple processing - - uniform results - - give IRIDITE the edge!

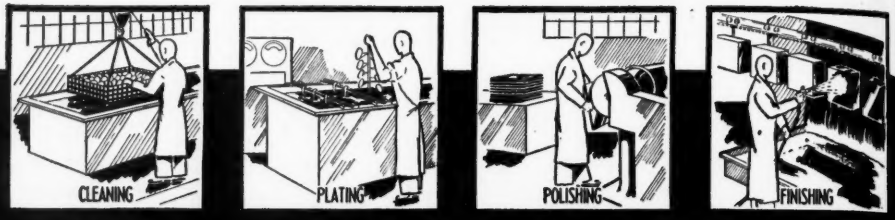
Here's a fast, sure way to lick corrosion . . . boost sales appeal and profits . . . in products of zinc, cadmium, galvanizing! Simply immerse parts in an Iridite solution . . . manually or automatically . . . in single racks or in bulk . . . for 15 to 60 seconds . . . at normal shop temperatures. No special equipment needed. No slow-down of production lines. Iridited parts are dried in a few seconds.

Use Iridite as a final protective finish . . . as a paint base for permanent adhesion . . . in combination with zinc plate to replace costlier materials. Iridite *unites chemically* with the metal . . . won't flake, chip or peel . . . won't alter dimensions. Available in bronze, olive drab, black and transparent Iridite Bright. Send today for your Free Test Panel, half coated with Iridite, half unprotected. Test it in your lab. *See* the difference! Write to: Allied Research Products, Inc., 4004 E. Monument Street, Baltimore 5, Maryland.

Maytag WRITES:

"Our investigation... has revealed increases in corrosion resistance...as much as 300% when compared to uncoated zinc and cadmium surfaces. IRIDITE was selected for this assignment due to its simplicity of maintenance and processing, and the uniformity of results obtained."

ALLIED RESEARCH PRODUCTS, INC.
IRIDITE
4004 E. Monument St., Baltimore 5, Md.

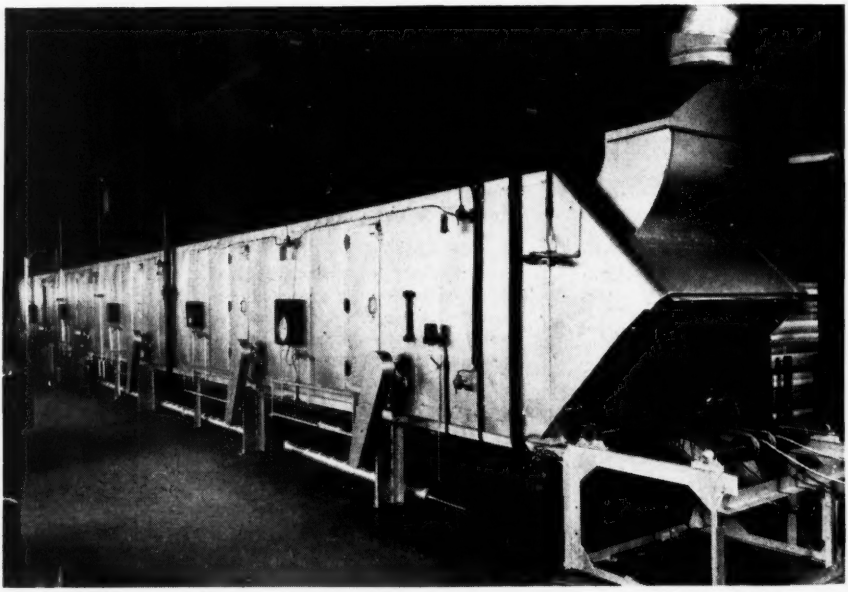


New Equipment and Materials

Young Brothers Continuous Conveyor Coating Oven

The accompanying illustration shows a continuous conveyor coating oven which has been developed by the Young Brothers Co., Detroit 7, Mich. The unit features a recuperating zone which recovers the stored heat in the metal sheets being processed and injects this heat back into the baking zone before the work leaves the insulated enclosure at the discharge end of the oven, thus effecting substantial savings in fuel consumption.

The oven is so designed that the burners are within the oven proper and so lo-

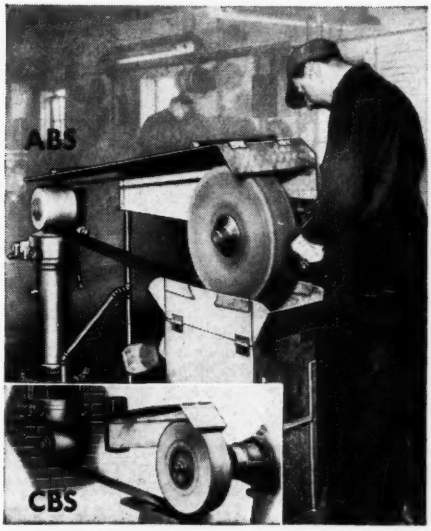


Young Brothers Continuous Conveyor Coating Oven

Your Men Produce More... if Grinding is Easier

PORTER-CABLE

BELT GRINDERS



• That's just plain common sense. If a man's work is made easier he's going to produce a lot more . . . and use less effort doing it.

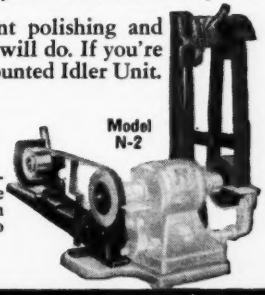
In hundreds of shops, operators are producing more and better work on Porter-Cable Belt Grinders because they don't have to "lay on." The belt runs cooler . . . remains sharp . . . and does not load. But that's not all.

The resilient Contact Roll does not wear as a wheel does. It does not nick or round off . . . does not require the time-wasting dressing you have to give a wheel. At all times, it is flat and square . . . and your work is better by far.

You'd be surprised how many widely different polishing and finishing operations the Porter-Cable Belt Grinders will do. If you're limited in floor space, you can use the CBS Wall Mounted Idler Unit.

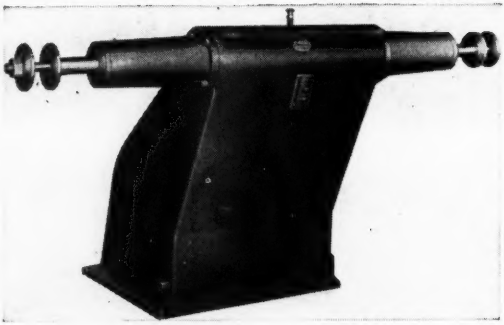
Get faster grinding from your bench grinders
Use the N-2 Abrasive Belt Attachment

Easily converts your bench grinders into abrasive belt grinders. Handles burring . . . provides contact grinding on the wheel . . . flat-grinding on platen . . . contour-grinding on the free section of the flexible belt. Quickly adjusted to either vertical or horizontal position.



PORTER-CABLE
MACHINE CO.
302-6 Wolf St. Syracuse 8, N. Y.

Belt grinding depicted on film
"MACHINE of the AGE"
Available for Exhibition FREE. WRITE!



Bradford Model 660 Overhang Buffer

Bradford Model 660 Overhang Buffer

A heavy duty overhang buffer especially adapted to long and deep work requiring maximum clearance is now being produced by The Bradford Machine Tool Co., Cincinnati 4, Ohio. Designated as the Model 660, the buffer is belt driven by a ball bearing motor of N. E. M. A. specifications. The motor platform is adjustable for belt tension, and the design of the machine permits drive belts to be changed without removing the housing from the shaft.

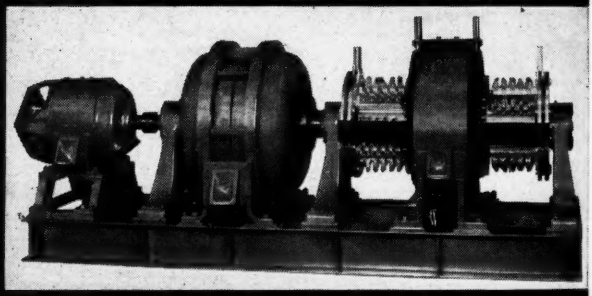
The Bradford Model 660 Buffer is equipped with a positive shaft lock, magnetic starter, overload protection, and under voltage release. The unit is available in a power range of from 3 to 20 h.p., with a speed of 2,400 r.p.m. or to specifications. The motor may be obtained for operation on 220-440 or 550 volts, 2 or 3 phase, 50 or 60-cycle current.

cated as to eliminate the danger of overheating the sheets due to direct radiation. The oven temperature is controlled by means of a modulating type of controller which regulates the heat input from each burner in each zone. Thus, the operator can vary the temperature to provide the amount of heat most suitable for various phases of the drying process.

The Young Brothers Continuous Conveyor Coating Oven is manufactured in various lengths, according to the individual production requirements of the user.

COLUMBIA MOTOR GENERATORS

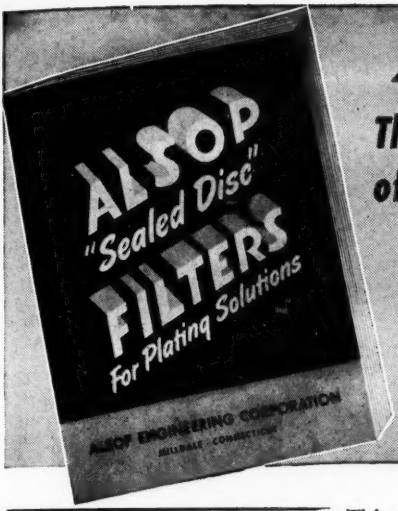
for Electroplating and other Electrolytic Processes



Columbia Generators embody every feature essential for dependable, 24-hour operation. They are built for electroplating service in sizes of 6 to 20 volts, 500 to 20,000 amperes, for anodic treatment of aluminum in sizes of 40, 50, and 60 volts, 500 to 3,000 amperes. Columbia Generators for other electrolytic processes range from ½ to 250 KW, 100 to 40,000 amperes, 6 to 60 volts. Write for full information.

COLUMBIA ELECTRIC MFG. CO.

4519 HAMILTON AVE., N.E. CLEVELAND 14, OHIO



Mr. Plater—

This New Book on Filtration of Electroplating Solutions

Based on 25 Years Filtration Experience

Was written especially for YOU

A SUMMARY OF CONTENTS

Explains the Fundamentals of Filtration for plating applications.

Describes the versatile, compact-Filters and outlines the superior features of the many sizes and capacities available.

Shows why the filter discs are easy and simple to change when necessary.

Suggests distinctive advantages for use in various plating installations and on practically all types of plating solutions.

Describes the unique sealed feature which provides positive protection against loss of solution through leakage and dripping.

Shows detailed diagrammatic views of internal and working parts and how they are used.

This fact-filled book just off the press was compiled to tell you exactly how, why and where *"Sealed-Disc"* Filters can help you get finer finished plated work from your plating solutions. It contains 50 carefully chosen photos, diagrammatic views and 4500 words describing the *"Sealed-Disc"* Filters and *"Centri-poise"* Pumps.

The *"Sealed-Disc"* Filter for plating solutions was designed in 1939 based on over 17 years previous filtration experience. Now after an additional 8 years of constant improving we feel that our latest models will meet even greater success in fulfilling the demands of the plater for a dependable filtration system. Send for your NEW BOOK today . . . mail the coupon below.

ALSOP ENGINEERING CORPORATION

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Please send me FREE, your NEW Book *"Alsop Sealed-Disc Filters For Plating Solutions."*

Name .....

Firm Name .....

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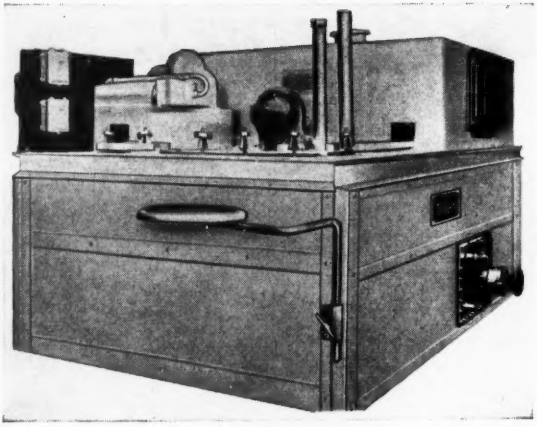
City ..... Zone..... State.....



Mabor Ball Bearing Washing Machine

Mabor Ball Bearing Washing Machine

A washing machine for the processing of ball bearings has been developed by the Mabor Co., Box 77, Rt. 3, Rahway, N. J. The variable speed conveyor of the machine is a link-chain mechanism wound around a series of sprockets supporting vertical pyramidal holders which accommodate the ball bearings. The races are rotated continuously by means of a friction strap and eccentric sprays which are directed between the two races. The sprays are actuated by two 2 h.p. pumps.

The machine may be used with any spray treatment utilizing one, two, or three different sprays. From 1,500 to 3,000 ball bearings in sizes up to 6 inches in diameter can be handled per hour in the machine, with larger quantities of bearings being accommodated through alterations. Loading and unloading in some cases can be made automatic. A blow-off and dryer attachment can be furnished if specified.

Any paint stripped from any surface

One-tenth the time . . . one-tenth the effort

Paint Flushed From Metal With Cold Water Rinse

Even toughest coatings are quickly flushed off in cold water after applying remarkable TURCO PAINT-GON. Simply spray, brush or scrub on. Paint rinses off freely after 5 to 20 minutes. Non-inflammable, non-corrosive.

Wood Stripped Clean Without Raising Grain

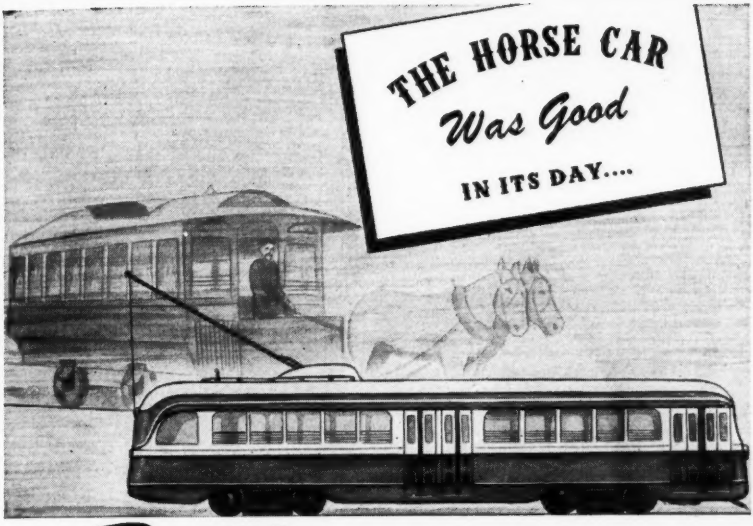
Amazing new TURCO PAINT-ZIP will not raise grain . . . strips *all* paint layers in *one* application. After wiping off with TURCO L-800, all gum, film and residue are removed and surface is ready for re-painting. Non-inflammable, gives off no dangerous fumes.

Phone your nearest Turco Field Engineer or write Dept. P.F. 6.

TURCO

WOOD & METAL PAINT STRIPPERS

TURCO PRODUCTS, INC. Main Office & Factory: 6135 S. Central Ave., Los Angeles 1
Offices & Factories: 125 W. 46th St., Chicago 9 - 1606 Henderson St., Houston 1, Texas
New York Office: 21 West Street, New York 6 - Offices & Warehouses in All Principal Cities
Canada: B. W. Deane & Company Limited, 751 Victoria Square, Montreal 1



BUT . . .

It passed from the American scene when metropolitan traffic grew too heavy for its one horse power. Today's streamlined model is an engineering triumph, embodying efficiency, speed and control among its many features.

CHEMICALS
ACP
PROCESSES

RUST PROOFING AND PAINT BONDING

Granodine *
Duridine *
Alodine *
Lithoform *
Thermoil-Granodine *

RUST REMOVING AND PREVENTING

Deoxidine *
Peroline *

PICKLING ACID INHIBITORS

Rodine *

Duridizing with *Duridine**

the modern metal conditioner, gives you simlar advantages.

Duridine cleans—removes oil, grease and other surface soil. It also phosphatizes—changes the metallic surface into a non-conductive phosphate film of uniform crystalline structure, a durable bond for organic finishes.

Utilizing power spray washers of mild steel construction, and applied in a simple, foolproof process, DURIDINE provides outstanding protection for painted sheet metal products.

*Trade Mark Reg. U. S. Pat. Off.

AMERICAN CHEMICAL PAINT CO.
AMBLER ACP PENNA.

The solvents used are emulsion or oil base cleaners, such as kerosene or similar compounds, to prevent the possibility of rust formation. The solvents are also continuously filtered to eliminate the return of harsh abrasives which might be damaging to the units being processed. The same equipment can be utilized for production runs of other parts, with or without rotation under sprays and with or without blowoff and drying.

Monomelt Stainless Steel Spray Booth

A compact, stainless steel spray booth which serves as a complete production unit for silver spraying objects in preparation for electroplating has been developed by the Monomelt Co., Inc., 1611 N. E. Polk St., Minneapolis, Minn. The unit is adapted to silver spraying plastic jewelry, plaster of paris and plastic figurines, composition toys, glass trays and dishes, novelties, radio and automobile parts, and similar products.

The booth is equipped with a foot-operated water spray, air reducer, plate glass baffle to protect the operator, air pressure indicator, safety valve, and rotating jig for holding the objects to be sprayed. A powerful suction fan draws excess spray out of the booth through a duct located directly behind the jig. A fluorescent light is built into the ceiling of the booth to afford adequate and non-glare illumination.

Constructed of stainless steel, the spray booth is highly resistant to the corrosive action of chemicals, and its smooth, simple design makes it easy to keep clean, the manufacturer states.

Monomelt Stainless Steel Spray Booth

Install NALCO

Infra-Red Lamps in Your Drying Units

Time tested—job tried, Nalco Infra-red lamps have proven highly efficient and long-lasting for all types of drying, baking or heating installations . . . self reflecting or clear glass type.

Send for "Drying Problems Made Easy"

North American Elec. Lamp Co.
1020 Tyler St. St. Louis 6, Mo.

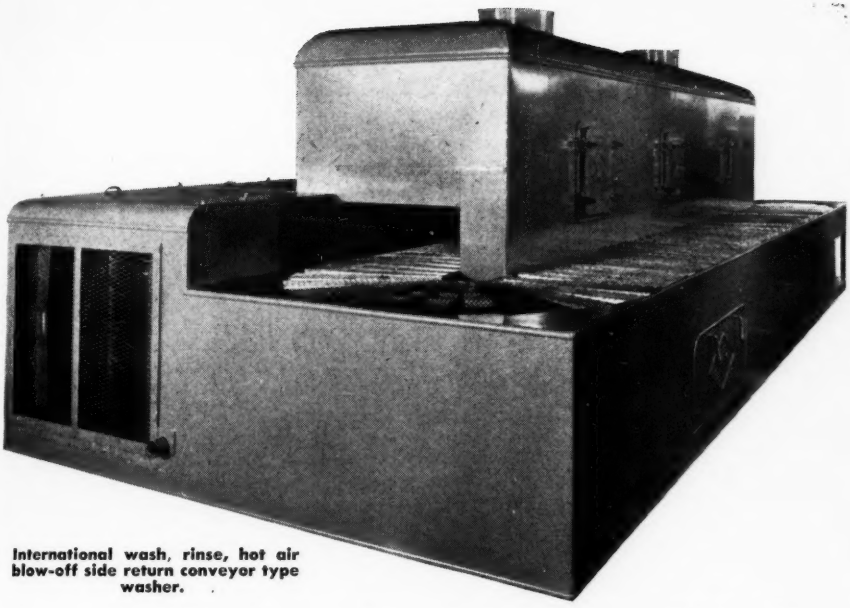
A New Aid to Pickling

NEPTUNE

(Pickling Accelerator)

1. Reduces fumes
2. Conserves acid
3. Prolongs life of solution
4. Reduces drag out

THE WM. M. PARKIN CO., • Highland Bldg., Pittsburgh 6, Pa.



International wash, rinse, hot air blow-off side return conveyor type washer.

Side Return Conveyor Type Washer

. . by *International*

Builders of Industrial Washers for Every Type of Business

Here's another example of International expert design and excellent construction — a side return conveyor type washer for small parts contained in baskets. It washes, rinses and employs hot air blow off. It is steam heated and operated by one man.

Put your large and small parts metal cleaning and washing problems up to our engineers. Their long experience in efficiently designing equipment for scores of industries insures the installation in your plant of dependable and profitable production units.

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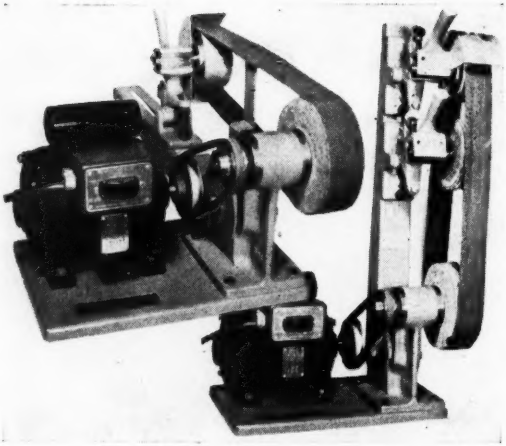

Porter-Cable Utility Grinder and Polisher set up in both a horizontal and vertical grinding position

Porter-Cable Utility Grinder and Polisher

Providing the advantages of grinding and polishing on an abrasive belt operating over a resilient contact roll or wheel, the Porter-Cable Utility Grinder shown herewith has been placed on the market by the Porter-Cable Machine Co., 302-4 Wolf St., Syracuse, N. Y. Since the wear is on the abrasive belt and not on the supporting contact wheel, this wheel or roll is said to remain flat, square at the corner or side, and to maintain its diameter and balance. The resiliency of the roll is claimed to eliminate chatter, thus enabling inexperienced operators to grind or polish smoothly on the machine.

Grinding on the roll quickly reduces the size of stock being ground, after which the stock can be squared up on the platen provided directly above the roll. The inside of a workpiece can be finished flat by working over the edge of the platen. For grinding and polishing certain rounded or oval parts, such as scissor handles, an additional re-

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STEP UP PRODUCTION

WITH THE

Hammond of KALAMAZOO

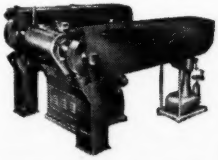
VROL (Variable Speed) POLISHING and BUFFING LATHE

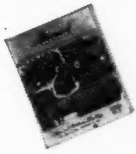
the DIAL does it!

The Hammond VROL Variable Speed Polishing Lathe definitely will step up production on finishing operations. Speeds from 1500 to 3000 RPM — instantly available at a turn of the dial while the lathe is in operation—make polishing and buffing (cut-color-satin) possible on one lathe without stopping the machine and with no lost motion or delay. Compensation for wheel wear is readily made by increasing wheel speed. Wheels can be used right down to the flanges without sacrificing finish.

VROL EASILY CONVERTED TO USE ABRASIVE BELTS

The work range of the VROL can be increased to include abrasive belt grinding and polishing operations simply by adding two Hammond No. 3 Backstand Units as shown at the left.





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See Hammond Equipment IN OPERATION in Booths 65, 66, 67 and 68 at the Industrial Finishing Exposition, Detroit, June 23-27.

Hammond Machinery Builders INC.

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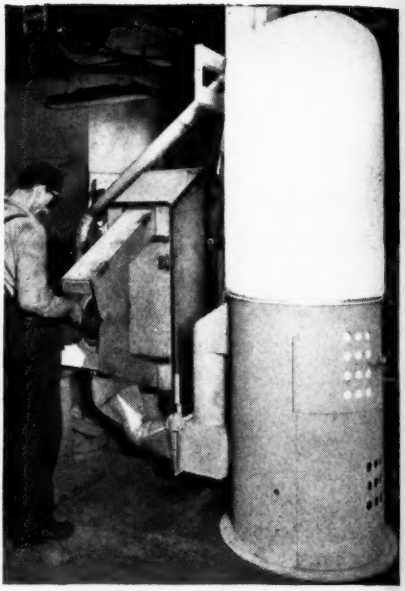
silient contact roll can be attached to the machine in place of the platen.

With the machine, the abrasive on a belt is fully exposed for work, thus increasing cutting efficiency and reducing operator effort. The unit can be set up in both horizontal and vertical grinding positions.

Kirk & Blum Self-Contained Dust Control Unit

Said to meet the needs of both large and small plants where layouts require the placing of one or more machines in buildings not served by the central dust control system or in isolated parts of the main plant building, the Kirk & Blum Self-Contained Dust Control Unit illustrated herewith is now being manufactured by The Kirk & Blum Manufacturing Co., 2816 Spring Grove Ave., Cincinnati 25, Ohio. Readily portable, the unit can be set up in any location to serve machines for brief or long periods of time as required. It is designed to handle dust, dirt, and other particles produced by grinders, buffers, polishers, and other equipment.



Kirk & Blum Self-Contained Dust Control Unit

In addition to being semi-automatic in its cleaning operation, the Kirk & Blum Self-Contained Dust Control Unit features an air volume of 900 c.f.m. at 2-inch suction; capacity for four 3-inch, two 4-inch or one 6-inch pipe connections; and a 4-cubic foot storage compartment. The unit is provided with a magnetic across-the-line type starter and is powered by a 3 h.p. 3,460 r.p.m. 220/440-volt 3-phase 60-cycle ball bearing motor. The weight of the unit is approximately 700 pounds.

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Cooper Gas-Fired Metal-Cleaning Tank

Cooper Gas-Fired Metal-Cleaning Tank

A gas-fired tank for cleaning metal parts in industrial, automotive plating, and other plants is now being manufactured by the D. C. Cooper Co., 1467 S Michigan Ave., Chicago 5, Ill. Where steam heating is desired, the tank is available equipped with steam coils.

According to the manufacturer, the sturdy construction of the Cooper Gas-Fired Metal-Cleaning Tank allows for its use in the cleaning of both large and small parts, such as transmissions, motor blocks, tractor parts, brake drums, carburetors, tools, nuts, bolts, and numerous other products. With the tank, parts are said to be cleaned so thoroughly that defects can be readily detected in the metal. The tank may also be used for the quick stripping of paints, baked enamel, and lacquers from steel and iron parts.

The Cooper Gas-Fired Metal-Cleaning Tank is built of heavy gauge metal for long life under the most severe usage and is equipped with 4-inch heating pipes that are located in the bottom of the unit. The tank is supplied complete with thermometer, drain, and overflow connections and can be equipped with an automatic agitating device. The unit is available in several models of various sizes to meet all cleaning requirements.

Grainlock
Polishing Wheel Cement

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Better Still, We Bring Them To You
Your Job Is Set Up To Your Entire Satisfaction
You Cannot Beat This Offer or The Results Obtained

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Get all the facts about this NEW, SUPER-TOUGH insulation now.

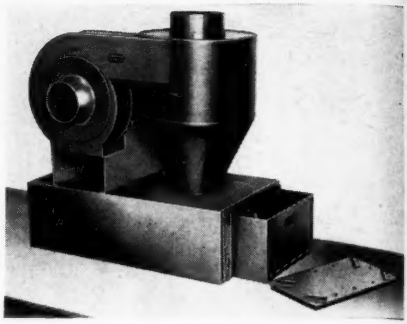
NELSON J. QUINN CO., Toledo 7, Ohio

BUNATOL

"Dustkop" Model 11N50 Dust Collector

Designed especially for collecting dust, lint, and dirt, resulting from heavy duty polishing, grinding, and buffing operations in those areas where outside exhaust is mandatory, the "Dustkop" Model 11N50 Dust Collector shown herewith has been placed on the market by the Aget-Detroit Co., 211 Main at Washington, Ann Arbor, Mich. The cycle separator is provided with a stack connecting sleeve so that piping can be easily installed to convey the cleaned air out-of-doors.

Powered by a 1½ h.p. continuous duty motor, direct driving paddle wheel, self-clearing fan, the unit is claimed to have a capacity in excess of 1,500 c.f.m. at 3.2 static suction on a 6½-inch diameter inlet. Removal of the collected dust is effected by means of a dust drawer in the base of the collector. The floor space required for installation of the unit is 20 x 36 inches while the overall height to the top of the cyclone is 35 inches. As a result of the compact construction, the unit can be easily placed directly behind the polishing lathe or grinder it is to serve. Installation can be further simplified by using flexible metal hose which makes a slip-fit with the inlet sleeve connection at the dust collector.



"Dustkop" Model 11N50 Dust Collector

Other than the occasional removal of the collected dust, the Dustkop Model 11N50 Dust Collector is said to require no further maintenance.

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DETROIT
Handy 'Tac' Rags
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Remove all Dust, Lint and Sand Particles from the Surface before Finishing.
Successfully used by leading Industrial Plants for over 11 years.
If your local Paint Dealer cannot supply you, write to Manufacturer.

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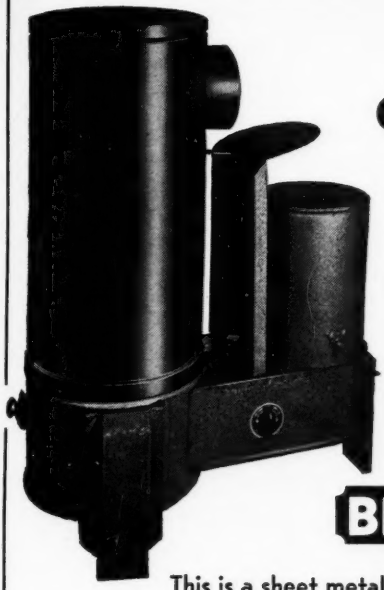
Baker Protective Plastic Cover

A plastic cover for laboratory equipment which is designed to afford protection against dust, dirt, spilled liquids, and so on, and, at the same time, allow for the observation of the instrument which has been covered is now being manufactured by the Baker Instrument Co., 17 S. Day St., Orange, N. J. The cover is made of a semi-transparent flexible plastic which is claimed to be non-hardening. All seams are machine sewn with a heavy grade black basting (other colors also available). Loops for removing the cover, as well as overlapping flaps, are optional.

The Baker Protective Plastic Cover is

For a real good polishing job use
Keystone TURKISH Emery
FRESH SUPPLY AVAILABLE
KEYSTONE EMERY MILLS Write for Sample 4316 Paul St., Phila., Pa.



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This is a sheet metal oil heater, manufactured in large quantities and finished with BLACK-MAGIC. BLACK-MAGIC was selected for the drum of this stove because its simplicity makes it possible for the manufacturer to secure an attractive finish and good corrosion and heat resistance at an economical cost. This is but one of thousands of uses for BLACK-MAGIC.

BLACK-MAGIC is an ***integral*** finish, not a coating; actual penetration is .0001". Very flexible. Products may be formed after processing—often an advantage. Also an excellent bond for paint and lacquer. Chemical reaction at 300° F. For iron and all steels except stainless. There are also BLACK-MAGIC baths for zinc, copper, brass and cadmium. Send for samples and the interesting "Black Book" of facts.

SILCO a glass-base, sprayed-on protective and beautifying finish for steel and brass products. In all colors. Write for samples.

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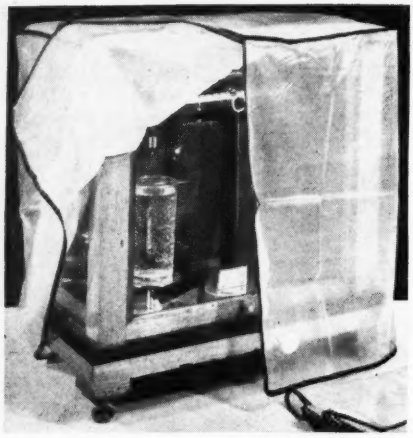
SILCO Glass-Base PROTECTIVE COATING
HEAT TREATING SALTS. CLEANERS. ETC.

N. Y. City: Lacquer Finishing Co., Inc., Clifton, N. J.—C. D. Hamilton, Fayetteville, N. Y.—CLEVELAND: Universal Paint & Varnish Co.—DETROIT: The Danell Co.—MILWAUKEE: A. F. C. Johnson.—PHILA.: Albert Printz, Germantown.—ST. LOUIS: G. S. Robins & Co.—DALLAS, Tex.: Texokana Supply Co.—LOS ANGELES: Barber-Webb Co.—OAKLAND: Geo. A. Kushman Co.



Baker Protective Plastic Cover

standardly available in designs for pH meters, balances, and scales. Special covers in any size desired can be obtained on order. Complete information can be obtained from the manufacturer.

Wyandotte "Emlon" Detergent

Known as "Emlon," a solvent emulsion type detergent for use in the metal-finishing industry is announced by the Wyandotte Chemicals Corp., Wyandotte, Mich. According to the manufacturer, the product is a unique combination of organic solvents and emulsifiers and lends itself to the formation of unusually stable emulsions even in the presence of acids, alkalis, and other electrolytes.

Emlon is said to be unusually effective and economical in a wide variety of applications, including power spray washers, pre-soak and still tanks, for cleaning prior to phosphatization, and as an adjunct to acid or alkali cleaners. In addition to many other uses where an emulsified solvent is desired, Emlon can be readily added to stamping and drawing compounds so as to facilitate their removal.

Wyandotte Emlon, it is claimed, can be safely used on ferrous as well as nonferrous surfaces. Its high boiling and non-foaming characteristics provide for long cleaner life in addition to making it easy to use. The product is available in 5, 15, and 55-gal. containers.

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ANY QUANTITY
ALL SIZES

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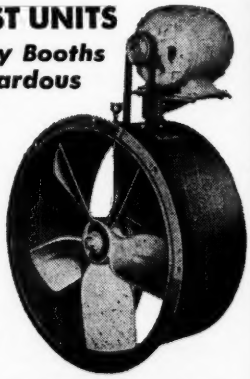
EXHAUST UNITS
for Spray Booths and Hazardous Locations



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12" to 42"

Free Delivery
C. F. M.
900 to 29200

Immediate Deliveries from Stock.

Also Manufacturers of a complete line of waterwash and dry type paint spray booths with accessories. *Send for details.*

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METALWASH

Washing
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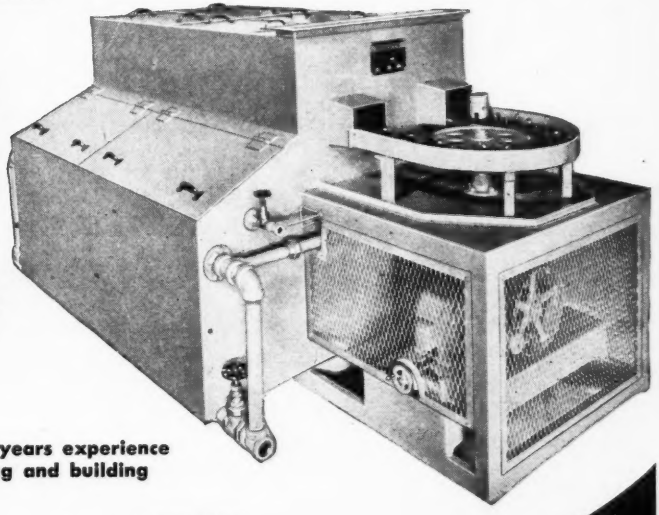
GLASS LENSES . . . PISTONS . . .
and Other Precision Parts

Pieces carried individually, eliminating marring or scratching. Positive and thorough removal of every particle of grinding and buffing compound. Any cleaning cycle, with spotless drying if required.



Twenty years experience designing and building

CLEANING • PICKLING
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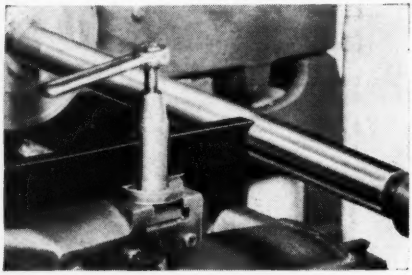
Equipment

Write us for further information.

METALWASH MACHINERY CO.
149-155 Shaw Avenue Irvington 11, N. J.

Sandusky Flexible Abrasive Stick

Made of carefully graded and selected abrasive grains bonded in high quality rubber, a flexible abrasive stick is now being offered in three grades and in a



Sandusky Flexible Abrasive Stick set-up in a lathe for polishing a metal bar

wide variety of shapes and sizes by the Sandusky Abrasive Wheel Co., 707 N. Ransom St., Kalamazoo, Mich., for use in light grinding, cleaning, deburring, rust-removing, honing, sharpening, polishing, and other operations. Tough, pliable, and long wearing, the stick, it is claimed, does not load or glaze and may be used dry or with water.

According to the manufacturer, one of the outstanding features of the Sandusky Flexible Abrasive Stick is the ease with which it can be cut and shaped for countless jobs such as finishing contours, grooves, beads, and other irregular or hard-to-get-at surfaces. The stick can be clamped in the tool post of a lathe for use in performing rapid, mechanical finishing operations on journals, rolls, shafts, spindles, and so on. For finishing and polishing threads, grooves, corners, curves, contours, and holes, triangular shaped and round-shaped sticks are said to be best suited. In reconditioning armatures and commutators after turning down, toolmarks can be removed with a coarse stick and then highly polished with a fine stick.

The Sandusky Flexible Abrasive Stick is available in 3, 6, and 8-inch lengths and in fine, medium, and coarse grades. Standard shapes include rectangular, square, triangular, and round, the sizes ranging from ¼ inch diameter in the round shape to 8 x 1 x ½ inch in the rectangular shape. Abrasive blocks measuring 4 x 4 x ¾ inch are also available for large area finishing operations.

Klarifiant

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- WATER BREAKS
- SLUDGE IN RESERVOIR
- LOSS OF PRESSURE

FOR DETAILS WRITE

The Du Bois Company

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Heilex 455 Protective Coating

A vinyl type coating for application to tanks and rack fixtures used in the plating and chemical process industries is announced by the Heil Process Equipment Corp., 12901 Elmwood Ave., Cleveland, Ohio. Designated as Heilex 445, the coating provides a tough surface that is claimed to be resistant to chemicals and to possess high bonding characteristics. Acids such as sulphuric, hydrofluoric, and hydrochloric as well as nitric and

ALLWOOD

"Vienna Brand" Lime

Made from Limestone that is identical in chemical analysis and geological structure with European Imported Lime. Tests show a "lime cake" made from Allwood "Vienna Brand" Lime equals the finish made from imported lime.

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Manitowoc • Wisconsin

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Insure safety from moisture, rust, dust, grit, internal and external. Will not corrode finest finishes. Fit any shape. Send for folder and prices.

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Mfrs. of Precision Paper Tubes, Bobbins, Coil Forms

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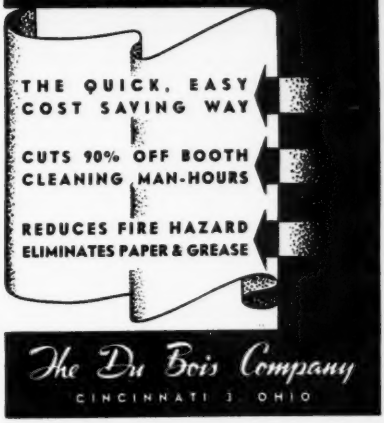

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BUFFING and POLISHING MACHINES

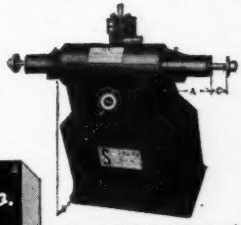
1500 to 3000 R.P.M. *Instantly* with the SPEEDIAL CONTROL!

The "Speedial" Control conveniently and quickly accomplishes infinite speed change between range of 1500 and 3000 R.P.M. High efficient production of buffing, polishing, coloring, etc., with uniform finish by maintaining constant peripheral speed. Longer wheel life. Reduced wheel cost.

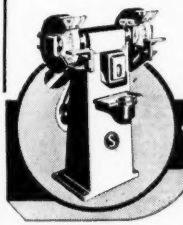
As wheels wear, turn "Speedial" to increase speed and operate wheels at correct peripheral speed. The "Speedial" instantly records the spindle speed.

"SPEEDIAL" CONTROL ON 11 MODELS FROM 1 H.P. TO 15 H.P.

- **Maintains peripheral speed throughout wheel life.**
- **Gives you maximum usable wheel life.**
- **Lower production costs.**
- **Higher production.**



Type RV 5 H.P. and 7½ H.P.



Be sure to visit us at Booth No. 83 at the Industrial Finishing Exposition, June 23-27, in Detroit.

The STANDARD ELECTRICAL TOOL Co.

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2518 RIVER ROAD

chromic oxidizing acids, are claimed to have no deteriorating effect on the protective coating.

Physically, Heilex 445 Coating is rubbery and durable, resisting abrasion and rough handling. If damaged by sharp objects, the coating can be readily repaired on the job site with a patching material available from the company. An additional property of Heilex 445 is its resistance to temperatures up to boiling.

Said to be ideal on equipment used in performing bright nickel plating operations, Heilex 445 Coating is claimed to provide good service on racks, stanchions, fixtures, and tanks in copper, nickel and chrome sequence. According to the manufacturer, the coating protects the plating solution from contamination and the rack from corrosion.

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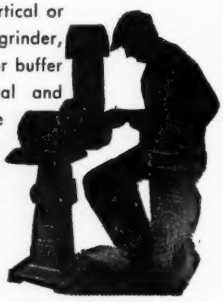
Binks Automatic Water Wash Spray Booth

Complete with all motors (AC 220/440), spray guns, etc. Manufactured in 1945 for spraying 105 MM shells. Used only 3 months. Can easily be converted to handle items from 1 oz. to 50 pounds.

THE J. W. BERGER CO.
Telephone: Diamond 7373
3301 Broadway Cleveland 15, Ohio

"Production" Type S
CENTERLESS
BUFFER • POLISHER
SURFACER

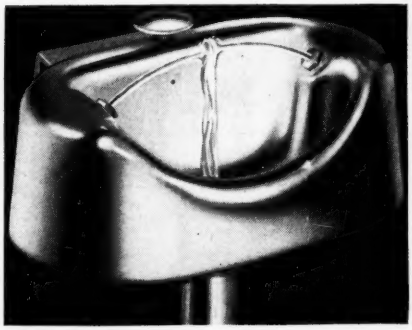
This machine combines a centerless feed polishing machine with a vertical or horizontal belt grinder, surfacer, polisher or buffer for both cylindrical and flat work. Can be used for anything that can be ground or polished — metals, rubber, fibre, wood, etc.



PRODUCTION MACHINE CO.
GREENFIELD MASS.

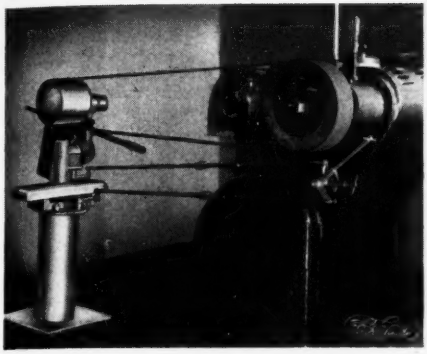
Eye Washing Fountain

An eye washing fountain for the immediate flushing of eyes that have been contacted by chemical splashes, vapors, or dusts has been designed by Benson & Associates, Inc., 332 S. Michigan Ave., Chicago 4, Ill., and is now being manufactured by the Precision Scientific Company of Chicago. The eye washer is essentially a double fountain with standard inlet and drainage connections. The openings are so arranged that two streams of water are simultaneously directed against the eyes. Water pressure can be regulated so that a soft stream is produced, assuring a copious flow.



Eye Washing Fountain

CADMIUM ANODES
Also Copper and Zinc Anodes
SABIN METAL CORP • 40 Lispenard St. • New York 13, N. Y.



DUAL REMOTE CONTROL*

MAKES THE

NIEDERST Back Stand Idler

— the most versatile in the field!

***Remote Control for Operation Ease**—idler pulley arm swings on a turret enclosing angular adjustment mechanism. Levers conveniently located on lathe allow control of both angular and wide range of lateral adjustments from operator's normal working position.

A host of other innovations achieved by the NIEDERST BACK STAND POLISHER, have earned it the title of "World's Workingest Idler." For better, faster, smoother abrasive belt polishing — *investigate NIEDERST now!*

DATA: Easily reversible to R.H. or L.H.; 5" side adjustment on Needle Bearings with Remote Control; Hydraulic Shock Absorber lowers weight slowly; easily tracks ¾" to 6" belts from Remote Control; Large Bearings Mounted in Arm for Lower Bearing Speeds, sealed for life with Non-Friction Grease Seals; Large Belt Length Adjustment; Counter Weighted for Steady Accurate Pressures.

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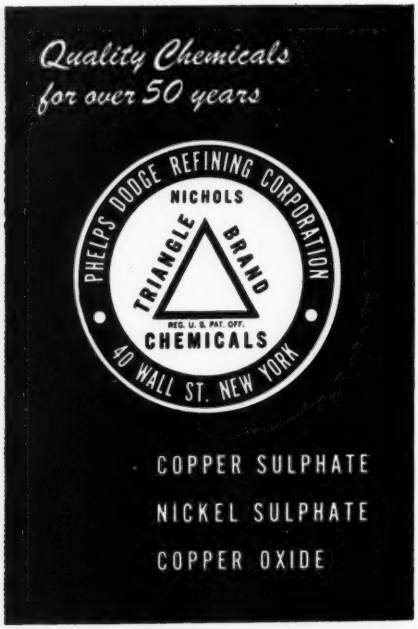
CARROLLTON, OHIO

The cast aluminum bowl is designed to fit the upper contours of the face. The actuating valve is operated merely by resting the head on the upper portion of the bowl where the eyes are in the ideal range of the streams of water. In addition, the design allows for freedom of the hands to spread the eyelids apart to assure contact of the water with every portion of the eye tissues which have been contacted for foreign substances. A pressure regulator is built into the actuating valve. The entire unit can be readly installed in any laboratory, plant, or first-aid room.



Divine Wheel Speed Table and Balancing Tubes. The Divine Brothers Co., 200 Seward Ave., Utica 1, N. Y., announces the publication of two bulletins, one of which contains brief definitions of buffing and polishing operations and includes a convenient table for estimating surface feet per minute from r.p.m. for wheels from 4 to 24 inches in diameter. Recommended wheel speeds for the various operations are also listed.

The other bulletin describes the balancing tubes available in Divine Clothflex polishing wheels. On the reverse side of the bulletin are descriptions of eight different hubs available on Divine polishing wheels. Copy of both bulletins free upon request.

"Tuf-On" P-70 Pri-Met, a specially formulated zinc chromate primer for brass, steel, tin, cadmium, lead, magnesium, zinc, bronze, aluminum, galvanized metal, and other difficult-to-coat metals, is the subject of a four-page technical bulletin prepared by the Brooklyn Varnish Manufacturing Co., Inc., Industrial Research Div., 50 Jay St., Brooklyn 1, N. Y. Copy of Technical Bulletin No. 101 free upon request.

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